Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	
Stale or Moot Docketed Proceedings	
1993 Annual Access Tariff Filings Phase I	CC Docket No. 93-193
1994 Annual Access Tariff Filings	CC Docket No. 94-65
AT&T Communications Tariff F.C.C. Nos. 1 and 2, Transmittal Nos. 5460, 5461, 5462, and 5464 Phase II	CC Docket No. 93-193
Bell Atlantic Telephone Companies Tariff FCC No. 1, Transmittal No. 690	CC Docket No. 94-157
NYNEX Telephone Companies Tariff FCC No. 1, Transmittal No. 328	

Direct Case of Verizon
April 11, 2003

EXHIBIT D

USTA Direct Case
filed August 14, 1995

DOCKET FILE COPY ORIGINAL

Before the
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In the Matter of:	)	
	)	
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and 5464	)	
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	)	
NYNEX Telephone Companies	)	
Tariff F.C.C. No. 1, Transmittal No. 328	)	
	)	

Direct Case Filing of the United States Telephone Association

INTRODUCTION

The United States Telephone Association (USTA) submits this direct case filing in the above-referenced proceeding. USTA is the principal trade association of the local exchange carrier (LEC) industry. USTA's memberhip of approximately 1100 telephone companies includes the LECs identified as parties to the investigation, listed in Appendix A to the Investigation Order.[1] As the Commission notes, these LECs include those price cap LECs who have not yet sought exogenous treatment of the costs incurred in implementing SFAS-106. USTA participates in this proceeding pursuant to the Commission's invitation for participation from interested persons. See Investigation Order, para. 13.

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[1] Order Designating Issues for Investigation, CC Docket 93-193, Phase I; CC Docket No. 94-65; CC Docket No. 93-193, Phase II, CC Docket No. 94-157, released June 30, 1995 ("Investigation Order").

DISCUSSION

USTA commissioned the study submitted by numerous price cap LECs as support for their tariff transmittals: Godwins, "Post-Retirement Health Care Study Comparison of Telco Demographic and Economic Structures and Actuarial Basis National Averages" (1992).[2] The Godwins study may be referred to by several LECs in their direct cases in this proceeding. In the interest of simplifying the Commission's review of these issues by avoiding duplicative filings, USTA is hereby resubmitting the Godwins study for the Commission's reference, included here as Attachment C. See Investigation Order, para. 13 (noting that the Godwins and NERA studies will be included in this investigation).

USTA is also submitting additional materials to assist the Commission in calculating the amount of OPEB-related costs eligible for exogenous treatment, and to support the LECs' access tariff filings. These materials include Attachment A, a new affidavit from Andrew Abel, Ph.D., and Peter Neuwirth, the original co-authors of the Godwins study. The Abel/Neuwirth statement summarizes the available evidence, and affirms that the original Godwins study is still valid for calculating the extent to which the cost increases engendered by SFAS-106 will be recovered through the GNP-PI element of the price cap formula.[3]

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[2] See Investigation Order, para. 13, n.28. Two LECs had included the Godwins analysis as support for their 1992 tariff transmittals: Bell Atlantic Tariff F.C.C. No. 1, Transmittal No. 497; US West Tariff F.C.C. Nos. 1 and 4, Trans. No. 246. Subsequently, many price cap LECs submitted this study as part of their 1992 Direct Case filing: Ameritech, BellSouth, NYNEX, SBC, SNET and US West. GTE and Lincoln Tel. Co. submitted the Godwins study with their 1993 access tariff filing.

[3] Although the Commission has since adopted GDP-PI, rather than GNP-PI in the LEC Price Cap Performance Review (CC Docket No. 94-1), FCC 95-132 (released April 7, 1995), the court remand requires that the Commission apply the original price cap rules (47 C.F.R. § 61.45(c), adopted in the LEC Price Cap Order, 5 FCC Rcd 6786, 6792), which utilize GNP-PI as the measure of inflation. See Southwestern Bell v. FCC, 28 F.3d 165, 172 (D.C. Cir. 1994). Moreover, this change in methodology has no impact on the results of the Godwins study. Abel/Neuwirth Statement, Attachment A, at 5.

USTA also includes a narrative statement explaining the results of the original Godwins study as Attachment B ("Cosby Introductory Statement"). Attachment D is an explanation of the macroeconomic model prepared in response to paragraph 16 of the Commission's Investigation Order in CC Docket 92-101.[4] Attachment E is the rebuttal analysis to accompany the 1992 Godwins study, and Attachment F is an additional analysis to explain the conservative nature of the Godwins study and to show the results of an additional sensitivity analysis. Attachment G is further explanation of the macroeconomic model used in the Godwins study, while Attachment H is a USTA ex parte which responds to arguments that the adoption of SFAS-106 has not changed actual costs.

USTA is also including as Attachment I the study performed by National Economic Research Associates (NERA) which, though utilizing a different methodology, supports the same conclusion as that reached by the Godwins study - that exogenous treatment of SFAS-106 costs will not lead to "double-counting" these costs by their inclusion in GNP-PI. The NERA study demonstrates that in fact only de minimis amounts of SFAS-106 costs are likely to be reflected in GNP-PI. As the Court of Appeals noted, the fact that the NERA study relies on assumptions which are "in sharp contrast" to those of the Godwins study renders the conclusions of both the NERA and Godwins studies "more robust." Southwestern Bell v. FCC, 28 F.3d at 171-172.

USTA submits this information in response to the Commission's request that LECs provide supporting studies, and descriptions of the macroeconomic model utilized. Investigation Order, paras. 24-25. As the Commission notes, this investigation necessarily involves the same type of cost information sought in the initial investigation of OPEB costs. Investigation Order, para. 15. Accordingly, USTA re-submits this information as persuasive evidence that the LECs have made reasonable and fair assumptions in calculating the costs of

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[4]Bell Atlantic Tariff F.C.C. No. 1, Trans. No. 497, US West Tariff F.C.C. Nos 1 and 4, Trans. No. 246, and Pacific Bell Tariff F.C.C. No. 128, Trans. No.1579, Order of Investigation and Suspension, 7 FCC Rcd 2724 (Com. Car. Bur. 1992)("1992 Investigation Order").

post-retirement benefits sought to be recovered through the investigated tariffs.

As the Court of Appeals recognized, the Commission has presented no basis to conclude that the costs imposed by the adoption of SFAS-106 do not meet the criteria for exogenous treatment codified in the price cap rules. Investigation Order, para.8; see Southwestern Bell, 28 F.3d at 172. The adoption of SFAS-106 does change the actual costs incurred by the carriers. Individual LECs will be submitting direct cases which support the level of costs sought to be recovered through the investigated tariffs. The Godwins study shows that these costs (both ongoing and transitional) are not recovered through elements of the price cap formula other than the ΔZ exogenous cost element. See, e.g., Godwins, Attachment C, p, 11.

Specifically, the Godwins study identifies the impact of SFAS-106 on GNP-PI and allows it to be discounted. Godwins found that the impact of SFAS-106 on GNP-PI (0.0124%) would result in only 0.7% of the Price Cap LEC's additional costs being recovered through an increase in the GNP-PI.[5] Even when conducting a sensitivity analysis, utilizing extremely unlikely combinations of implausible parameter values, the authors of the Godwins study found that only a small percentage of SFAS-106 costs would be recovered through GNP-PI. See, e.g., 1993 Supplemental Report, Attachment F, at 14-38.

Additionally, Godwins shows that significant recovery of SFAS-106 costs through the macroeconomic effects on wages created by SFAS-106 is unlikely. Godwins demonstrates that such recovery will in fact only occur after all macroeconomic variables have adjusted to new equilibrium levels, a process which is likely to take a few years to complete. See, e.g., Abel/Neuwirth Affidavit, Attachment A, at 2; Godwins Study, Attachment C, p.11.

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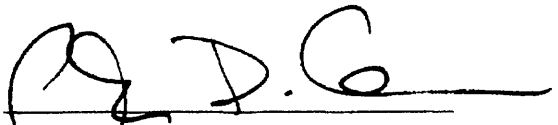
[5]The NERA study supports a similar conclusion. The NERA study concluded that less than 6.26% of the exogenous cost change is reflected in the GNP-PI. NERA Study, Attachment G, at 32.

CONCLUSION

The Commission should permit LECs to recover as exogenous an amount of SFAS-106 costs which is consistent with the amount demonstrated by the Godwins and NERA analyses to be not reflected in the GNP-PI component of the price cap formula.

Respectfully submitted,

UNITED STATES TELEPHONE ASSOCIATION

BY 

Mary McDermott
Linda Kent
Charles D. Cosson
U.S. Telephone Association

1401 H Street, NW
Suite 600
Washington, DC 20005
(202) 326-7249

Its Attorneys

August 14, 1995

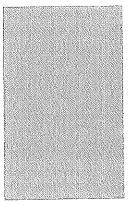
CERTIFICATE OF SERVICE

I, Mauricio Cifuentes, do certify that on August 14, 1995 copies of the Reply of the United States Telephone Association were either hand-delivered, or deposited in the U.S. Mail, first-class, postage prepaid to the persons on the attached service list.

Mauricio Cifuentes

Table of Attachments

Attachment A - 1995 Abel/Neuwirth Affidavit



United States Telephone Association

Perspectives on Analysis of Impact of
SFAS 106 on GNP-PI

August 14, 1995

Towers Perrin

Introduction

In order to assist in responding to the FCC's recent Order Designating Issues for Investigation, the United States Telephone Association ("USTA") has asked us to provide a summary of our prior analysis of the impact of SFAS 106 on GNP-PI and to provide an opinion as to the extent to which that analysis should still be considered valid now that three years have passed since the original study was issued and SFAS 106 has now been adopted by all companies for whom it was required.

As discussed in this material, we believe that the actual impact of SFAS 106 on GNP-PI was not materially different than that estimated in our original analysis. Further, we believe that the actual portion of the Price Cap LEC's additional cost due to the adoption of FAS 106 in 1993 that recovered through the GNP-PI was not materially different than that reported in our original analysis.

The rest of this material reviews our prior analysis and discusses this conclusion in more detail.

Determination of Impact of SFAS 106 on GNP-PI

In our original study ("Analysis of Impact of FAS 106 Costs on GNP-PI") issued in February 1992, we provided an analysis of what percentage of the additional costs incurred by Local Exchange Carriers subject to Federal Price Cap regulations (hereinafter referred to as "Price Cap LECs") as a result of the Financial Accounting Standards Board's Statement No. 106 (SFAS 106) would be reflected in the GNP Price Index (GNP-PI) and what percentage would not be so reflected.

That study found that ultimately the increase in GNP-PI caused by SFAS 106 (0.0124%) would provide for recovery of only 0.7% of the additional costs incurred by Price Cap LECs. This result was produced by performing both an actuarial analysis and a macroeconomic analysis. The actuarial and macroeconomic analyses were performed in a very conservative manner to ensure that we did not understate the effect of SFAS 106 on the GNP-PI.

In addition to developing this basic result, the study included a sensitivity analysis to test the robustness of the result. That sensitivity analysis lent further support to our finding that any resulting increase in the GNP-PI would allow the Price Cap LEC's to recover only a very small fraction of their additional costs due to SFAS 106.

Subsequent to the submission of the study, we were asked by the FCC staff to extend our analysis in two ways. First, we were asked to develop a "best estimate" determination of the impact of SFAS 106 on the GNP-PI; secondly, we were asked to extend our sensitivity analysis to include every possible combination of parameter values regardless of how unreasonable or internally inconsistent those combinations might be. We performed the additional analysis and reported the results in a supplemental report issued in March 1993. In that report, we found that on a "best estimate" basis, only 0.3% of the Price Cap LEC's additional costs due to SFAS 106 would be recovered as a result of increases in the GNP-PI. As might be expected, for some of the parameter combinations examined in the extended sensitivity analysis, the percentage of additional SFAS 106 costs recovered through the GNP-PI was higher than in the original sensitivity analysis. However, even these higher values indicated that only a small fraction of additional SFAS 106 costs would be recovered through the GNP-PI. Moreover, these higher values resulted only from extremely unlikely combinations of parameter values. For example, the ten highest values were obtained only with a price elasticity of demand equal to 3.0, and with a direct impact of SFAS 106 on labor costs in sector 2 of 4.5%. As discussed in the March 1993 Supplemental Report, price elasticities of demand in sectors 1 and 2 are almost surely less than 1.0, and our baseline value of 1.5 for this elasticity was chosen to guard against understating the impact of SFAS 106 on the GNP-PI; a value of 3.0 for this elasticity is too high to be taken seriously. Also the value of 4.5% for the direct impact of SFAS 106 on labor costs in sector 2 is almost double the best estimate of 2.5% and is less plausible than the baseline estimate of 3.0%.

We want to emphasize that the original study was done in a very conservative manner and the baseline result of that study (0.7% of the Price Cap LEC's additional costs recovered through GNP-PI increases) is more than twice the value produced under a "best estimate" approach. Pages 34-38 of the original study provide a detailed discussion of the conservative nature of the analysis, including a discussion of the rationale behind the choice of each actuarial and macroeconomic parameter utilized in the study.

Additional Macroeconomic Effect of SFAS 106

Above and beyond the GNP-PI effect reported above, when the original study was done, our macroeconomic model indicated that, in response to the impact of SFAS 106, the wage rate in the national economy will, over time, reduce in relative terms by 0.93% (i.e., relative to what it would have been in the absence of SFAS 106). To the extent that a Price Cap LEC could also benefit from a relative reduction in its wage rate, this would help offset its increase in costs due to SFAS 106. If a Price Cap LEC's were able to achieve the full reduction of 0.93%, it would finance 14.5% of its additional SFAS 106 costs. As discussed in our report, this wage rate reduction reflects the ultimate effect of SFAS 106 after all macroeconomic variables have adjusted to their new equilibrium levels. This macroeconomic adjustment is unlikely to be completed within a year, and may indeed take a few years to complete. Thus, during 1993, the fraction of additional SFAS 106 costs financed by a relative reduction in wages is likely to be less than 14.5% — perhaps substantially less.

Thus, even after complete macroeconomic adjustment has taken place, the combined effect of the impact of SFAS 106 on the GNP-PI and on the wage rate would still leave 84.8% (i.e., 100% minus 0.7% minus 14.5%) of the Price Cap LEC's additional SFAS 106 costs unrecovered. The original study also included sensitivity analysis on how much of the Price Cap LEC's additional costs could potentially be recovered through the combination of increases in GNP-PI and this wage rate effect. That analysis lent additional support to our finding that 15.2% was a reasonable estimate of the fraction of additional costs that would be recovered through the combination of both sources.

Again, in response to the FCC staff requests, the analysis of the impact of the combination of GNP-PI increases and potential wage rate reductions was extended to produce a "best estimate" impact and a sensitivity analysis incorporating all combinations of actuarial and macroeconomic parameters. On a best estimate basis, we determined that 12.7% of the Price Cap LEC's additional costs would be recovered through the combination of GNP-PI increases and wage rate reductions; the additional sensitivity analysis again confirmed our finding that most of the Price Cap LEC's additional costs would not be recovered through the GNP-PI and other macroeconomic effects.

Purpose of Sensitivity Analysis

As noted above, our original report (February 1992) contained a sensitivity analysis. At the request of the FCC staff our March 1993 Supplemental Report contained additional sensitivity analysis (while this sensitivity analysis broadened the range of parameter values considered, many of these additional combinations of parameters were, as explained below, implausible.) In order to interpret and apply the results of these sensitivity analyses, it is important to keep in mind the purpose of these analyses and the conservative philosophy underlying their implementation. We have already discussed that our conservative approach produced a baseline calculation of the impact of SFAS 106 on GNP-PI that is larger than a calculation based on our best estimates. The comprehensive sensitivity analysis provides an additional degree of comfort that the baseline results are, in fact, conservative.

The primary goal of the sensitivity analysis was to explore the robustness of our findings and to illustrate the quantitative impact on our findings of various changes in the numerical values of the inputs. *The ranges of values used in the sensitivity analysis were not intended to represent the ranges of plausible parameter values.* Instead, our conservative approach led us to choose ranges of values so wide they include all plausible values, and then some. To guard against the risk of omitting some plausible values, we intentionally used ranges of values so wide they include implausible values as well. As a consequence, some of the extreme values of the calculated effect of SFAS 106 on the GNP-PI simply reflect implausible values for inputs.

As discussed earlier, our March 1993 Supplemental Report contains a best estimate of the impact of SFAS 106, as well as a conservative baseline estimate, and a comprehensive sensitivity analysis. Our best estimate (p. 14) is that only 0.3% of the increase in the Price Cap LECs' costs due to SFAS 106 are recovered through the GNP-PI. This finding illustrates that our baseline calculation of 0.7% is indeed conservative. The comprehensive sensitivity analysis, which included input values that are clearly implausible, produced some results for the impact on GNP-PI that are considerably larger. The sensitivity analysis considered three different values of each of four different inputs to the macroeconomic model, two different values of one input, and four different values of one input,[1] and computed results using all 648 (= 3 x 3 x 3 x 3 x 2 x 4) combinations of these values.

Finally, note that using two or more implausible values together heightens the degree of implausibility. For example, suppose there is only a one in a hundred chance that the price elasticity of demand is as high as 3.0 and there is only one in a hundred chance that the direct impact of SFAS 106 on labor cost in sector 2 is as high as 4.5%. Then there is only one chance in 10,000 that both values together are appropriate. To reiterate, our sensitivity analysis

[1] Three values of the direct impact of SFAS 106 on labor costs in sector 2, 3 values of labor share in total cost in sector 1; 3 values of labor share in total cost in sector 2; 3 values of the fraction of labor employed in sector 2; 2 values of the price elasticity of demand; 4 values of the labor supply elasticity.

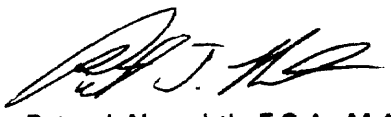
presents the results for all combinations of parameter values, including many combinations too implausible to merit any attention.

Validity of Original Study

Based on the discussion above, it is clear that our original study was done in a conservative manner, most likely overestimating the impact of SFAS 106 on the GNP-PI. In addition, comprehensive sensitivity analysis was performed to confirm the robustness of the result against the possibility of error in estimating one or more of the economic or actuarial parameters used in the study.

Three years have passed since the original study was issued. During that time, all companies providing postretirement welfare benefits adopted SFAS 106. Based on what we now know, we believe our estimate of the impact of SFAS 106 on the GNP-PI[2] and of the percentage recovery of the Price Cap LEC's additional costs incurred by their adoption of SFAS 106 is still reasonable. Furthermore, the conservatism inherent in our original study gives us confidence that the actual recovery of additional SFAS 106 costs through the GNP-PI when SFAS 106 became mandatorily effective in 1993 was not materially greater than the 0.7% in our baseline results.

Respectfully submitted,



Peter J. Neuwirth, F.S.A., M.A.A.A.

Andrew B. Abel, Ph.D.

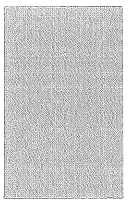
2 Since our original report was issued, the measure used in the FCC's price cap methodology was changed from GNP-PI to GDP-PI. This change would have no impact on the results of our study. Not only does the formal mathematical model ignore any distinction between GNP-PI and GDP-PI, the actual data (presented in Table I) show only a minuscule difference between these two measures of the overall price level.

Table 1: GDP-PI and GNP-PI

price index	1988	1989	1990	1991	1992	1993
GDP-PI	104.0	108.6	113.6	118.1	121.9	125.5
GNP-PI	104.0	108.6	113.6	118.1	121.8	125.4

Source: Survey of Current Business, August 1994. GDP-PI is from Table 7.1, p. 32, line 5, price index, fixed 1987 weights; GNP-PI is from Table 7.3, p. 40, line 5, price index, fixed 1987 weights.

Attachment B - 1993 Cosby Introductory Statement



Best Estimate Increases

TELCO's Unrecovered SFAS 106 Costs

March 1993

By Randy Cosby

Note: This description was originally filed in Southwestern Bell Telephone Company's July 1, 1993 Annual Access Tariff Filing, Transmittal No. 2271, filed April 2, 1993, Description and Justification, Appendix B. As described on page 3-9 of SWBT's D&J: "Appendix B, titled "Best Estimate Increases TELCO's Unrecovered SFAS 106 Costs" is a description of the New Godwins analysis that was prepared by Randy Cosby, a[n] independent professional writer and editor. Randy Cosby's narrative is intended to cut through the technical writing style that has been typical of the actuarial and macroeconomic analysis presented on the formal record during the SFAS-106 debate. Cosby's description of the Godwins analysis has been thoroughly reviewed by the authors of the Godwins analysis, who concur that the Cosby narrative represents an accurate description of the current Godwins analysis."

New Findings Prove Strength of Original Request

More than 87% of the cost of adopting the SFAS 106 accounting procedure will not be recovered by local exchange carriers subject to federal price caps (Price Cap LECs) without exogenous treatment, according to a "best estimate" prepared by Godwins for the United States Telephone Association (USTA).

The best estimate, and an expanded sensitivity analysis showing 648 potential scenarios that could change the amount of SFAS 106 costs recovered by Price Cap LECs, were requested by the Federal Communications Commission. (See the FCC's Jan. 22, 1993 Order in CC Docket No. 92-101, paragraphs 63 and 64).

The best estimate shows that only 0.3% of the costs are reflected in the GNP price index and 12.3% might be recovered by a reduction in the wage rate and other macroeconomic adjustments, leaving more than 87.3% of the costs unrecovered.

The finding underscores the conservative nature of the Price Cap LECs' request for exogenous treatment made last year. In that request, which was based on a study by Godwins, exogenous treatment was sought for only 84.8% of the costs of SFAS 106 -- 2.5 percentage points less than the best estimate now clearly indicates is reasonable.

The earlier calculation estimated that 0.7% of the costs would be recovered in the price index and 14.5% might be recovered by a reduced wage rate.

Given the philosophy followed in the Godwins study, it should come as no surprise that the best estimate is higher than the original estimate cited in the study. The study generally used conservative values when setting parameters for the actuarial and macroeconomic analyses used to gauge the impact of SFAS 106 on TELCO, a composite company constructed to more easily quantify statistics compiled from the 11 Price Cap LECs.

At every juncture, Godwins used values that avoided giving unwarranted benefits to TELCO. The intent was to avoid potential claims of double-counting by erring in the direction least favorable to Price Cap LECs.

For example, in the macroeconomic model Godwins overstated the impact on GNP-PI by using a baseline value of price elasticity of demand that is almost certainly too high. When this value was reduced to a more likely level for computation of the best estimate of recovery, it reduced the amount of costs TELCO would recover through the GNP-PI and other macroeconomic effects.

A similar result occurred when Godwins overstated a value for labor supply elasticity which, like price elasticity of demand, is among several economic parameters used to determine how much of SFAS 106 costs will be recovered through the GNP-PI.

The study's conservative bent also is shown in the actuarial analysis by use of a 3% figure to quantify the direct impact of SFAS 106 on labor costs for the portion of the economy that includes businesses providing post-retirement benefits. The best estimate places this value at 2.5%, fully a half-percent lower than

the conservative estimate.

It is with a firm belief in the Godwins study, and with steadfast support for the actuarial and macroeconomic analyses on which the study is based, that the 84.8% estimate used by the Price Cap LECs in their filings last year, is reaffirmed.

Conservative Estimate Is Built On Sound Foundation

The conservative estimate developed by Godwins in this study is built on a firm foundation composed of an actuarial analysis, as well as a macroeconomic analysis that uses parameters derived from the actuarial study.

Using extensive demographic, economic and benefit program data collected from 11 Price Cap LECs, the actuarial analysis constructs TELCO, a composite company that closely reflects the entire industry's characteristics.

When compared to the average employer in the economy, the effects of SFAS 106 on TELCO's costs are disproportionately higher due to a combination of factors. Its work force stays on the job longer, retires earlier, has a higher ratio of retired-to-active workers and has a higher proportion of covered workers.

The situation is offset somewhat by the fact that TELCO's labor costs are a lower percentage of total costs than of the average employer in the GNP.

Given these circumstances, the average employer in the economy will experience only 28.3 percent of the cost increase from SFAS

106 that will hit TELCO.

Among the steps taken to obtain the results:

* A comparison of TELCO's benefits program to a "national average" benefit program developed through the use of a database of provisions of retiree medical plans sponsored by 830 private-sector companies employing 19 million workers, which is well over half of all covered employees in the United States.

* Adjustments for differences in programs and other factors, such as the average age of employees, length of service, retirement patterns, number of retirees and current level of pre-funding of benefits.

The actuarial analysis also utilizes a number of factors to develop a formula that quantifies the direct impact of SFAS 106 on labor costs for the portion of the economy that includes businesses providing post-retirement benefits. The best estimate places this value at 2.5%, fully half a percentage point lower than the 3% conservative estimate used in the Godwins study.

Through its examination of the impact of SFAS 106 costs on the economy as a whole, the macroeconomic analysis divides the 95.8 million private-sector workers in the national economy into two groups. They are:

* Sector 1: An estimated 65.1 million workers who have no post-retirement plan covered by SFAS 106 rules; and

* Sector 2, an estimated 30.7 million workers eligible for some type of retirement plan, the cost of which ultimately will be

reflected in SFAS 106 costs.

The macroeconomic model also finds that only 2.3% of the average employer's additional costs resulting from SFAS 106 is passed through to the GNP price index. Consequently, TELCO stands to recover only .7% through the GNP-PI because the actuarial analysis finds the price index will reflect only 28.3% of the additional costs incurred by the average Price Cap LEC due to SFAS 106.

Although it first appears that this means 99.3% of TELCO's additional costs are unrecoverable, the macroeconomic analysis determines that the national wage rate might be 0.93% lower than it would have been in the absence of SFAS 106.

Consequently, if TELCO can achieve a similar reduction in its wage rate, another 14.5% of SFAS 106 costs could be recovered, lowering its total unrecovered costs to the conservative estimate of 84.8% that is being sought for exogenous treatment.

Some Outcomes Are Not Realistically Conceivable

As explained in the original Godwins study, the macroeconomic model for determining how much of the SFAS 106 costs are unrecoverable can, by adjusting the values of its parameters, be used to obtain numerous possible outcomes.

Godwins attempted to display the sensitivity of the results in

its original study by showing an extremely wide range of possible outcomes--as well as the conservative estimate believed to be a reasonable basis for exogenous treatment.

However, the Commission subsequently requested, and now has been provided, all 648 estimates, as well as an overall best estimate.

This list shows all outcomes associated with all "possible" parameter values. But it must be understood that results at either end of the spectrum are based on extreme values and simply are not realistically conceivable.

That is the case with at least three of the parameter values which show more than 40% of costs being recovered through GNP-PI and macroeconomic adjustments. This occurs because any attempt to display every combination of parameter values requires some of those values to be set at levels needed simply to fill out the "grid" of possibilities.

For example, the outcomes in question are based on unrealistic values for:

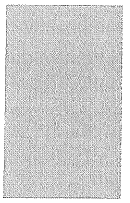
-- Price elasticity of demand. The flawed combinations of parameters use a value of 3.0, which is much too high to be plausible. The baseline calculation purposely uses a value of 1.5 that is too high in order to guard against the possibility of understating the impact of SFAS 106 on GNP-PI. The true value almost surely is less than 1.0.

-- The direct impact of SFAS 106 on labor costs in sector 2,

the segment of the economy encompassing covered workers. The 4.5% value applied here is much too high, as evidenced by the 2.5% value used to develop the best estimate and the 3% value used in Godwins original conservative estimate.

The foregoing is why all of the combinations of parameter values that show less than 60% of additional SFAS 106 costs being recovered without exogenous treatment simply are not worthy of consideration.

Attachment C - 1992 Original Godwins Study



UNITED STATES TELEPHONE ASSOCIATION

Analysis of Impact of FAS 106 Costs on GNP-PI

Godwins

February, 1992

UNITED STATES TELEPHONE ASSOCIATION

Analysis of Impact of SFAS 106 Costs on GNP-PI

February 18, 1992

Godwins

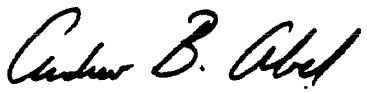
BACKGROUND

Godwins has been engaged by the United States Telephone Association to perform an analysis of the impact of SFAS 106 on the GNP-PI. In particular, Godwins was asked to determine the extent to which the price cap mechanism utilized by the FCC will reflect the impact of SFAS 106 and will enable Local Exchange Carriers to recover their increase in total operating costs incurred due to their adoption of the new accounting standard.

This report describes the results of that analysis and provides detailed documentation of the data, methods, and assumptions utilized in the study.

Respectfully submitted,

Peter J. Neuwirth, F.S.A., M.A.A.A.



Andrew B. Abel, Ph.D.

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I. EXECUTIVE SUMMARY

The purpose of this study is to determine what percentage of the additional costs incurred by Local Exchange Carriers subject to Federal Price Cap regulations (hereinafter referred to as "Price Cap LECs") as a result of the Financial Accounting Standards Board's Statement No. 106 (SFAS 106) will be reflected in the GNP Price Index (GNP-PI) and what percentage will not be so reflected.

This study finds that ultimately the increase in GNP-PI caused by SFAS 106 (.0124%) will provide for recovery of 0.7% of the additional costs incurred by Price Cap LECs. Other macroeconomic factors, principally an eventual adjustment of the national wage rate, account for recovery of an additional 14.5% of the additional costs incurred by Price Cap LECs, leaving 84.8% of these additional costs unrecovered.

This study is presented in two stages: an Actuarial Analysis followed by a Macroeconomic Analysis. The Actuarial Analysis uses demographic, economic and benefit program data collected from each Price Cap LEC to construct a composite company (hereinafter referred to as "TELCO") which reflects the characteristics of the industry as a whole. This analysis finds that the impact of SFAS 106 on the costs of the average employer in the economy is only 28.3% of the corresponding impact on TELCO. The Macroeconomic Analysis which analyzes the impact of SFAS 106 on the economy as a whole finds that only 2.3% of the average employer's additional costs resulting from SFAS 106 is passed through to the GNP-PI.

The table on the following page summarizes how the key results of the study are combined to derive the unrecovered proportion of the Price Cap LECs' SFAS 106 costs.

Effects of SFAS 106 on TELCO's Costs

(A)	Impact on national average costs relative to TELCO's costs (from the Actuarial Analysis)	28.3%
(B)	Proportion of increase in national average costs passed through to GNP-PI (from the Macroeconomic Analysis)	2.3%
(C)	Proportion of TELCO's SFAS 106 cost increase reflected in GNP-PI (item (A) x item (B))	0.7%
(D)	Proportion of TELCO's SFAS 106 cost increase offset by other macroeconomic adjustments, including the reduction of the wage rate (from the Macroeconomic Analysis)	14.5%
(E)	Proportion of TELCO's SFAS 106 cost increase unrecovered (100% - item (C) - item (D))	84.8%

Actuarial Analysis

Even if one were to take a conservative approach and assume that all SFAS 106 costs were passed through directly and completely to price increases and thus into the GNP-PI, 100% of each Price Cap LEC's SFAS 106 costs would be reflected in the GNP-PI, only if the following were true:

- The benefits provided by the Price Cap LEC to its employees were at the same level as those provided to all other employees in the economy.

- The benefits provided by the Price Cap LEC gave rise to the same relative increase in total costs as for other employers when SFAS 106 is applied.

Because neither of the above statements is true, the percentage of each Price Cap LEC's SFAS 106 costs that will be reflected in the GNP-PI is far less than 100%. Indeed, we have determined that ignoring macroeconomic effects, only 28.3% of the additional costs incurred by the average Price Cap LEC due to SFAS 106 would be reflected in the GNP-PI. This result was derived by the following steps:

- By utilizing demographic, economic, and benefit program data collected from each Price Cap LEC we constructed a composite company (hereinafter referred to as "TELCO") which reflects the characteristics of the industry as a whole.

- By utilizing a data base of plan provisions for retiree medical plans sponsored by 830 private sector employers (covering 19 million employees) and our Benefit Level Indicator ("BLI") methodology, we determined how TELCO's program compared to a "national average" benefit program.

- We adjusted this comparative benefit analysis to reflect specific factors that would cause similar benefit programs to generate different levels of SFAS 106 cost. In particular, we adjusted for:

  - differences in demography (average age, service, etc.)
  - differences in withdrawal and retirement patterns
  - differences in the number and impact of current retirees
  - differences in the extent of current pre-funding of benefits conducted by TELCO and that of others.

- We then took account of the very large group of workers in the national economy who are not covered by any post-retirement program or are covered by a program that is not affected by the FASB's rules. Their employers will, by definition, incur no SFAS 106 cost for them.

- We made two final adjustments to the comparative analysis due to economic factors. In particular, we:

  - made an adjustment for differences between per unit labor costs for TELCO and for other employers, and

  - made an adjustment for differences in the percentage of total output represented by labor costs for TELCO and for other employers.

Putting together all of these factors, we find that the impact of SFAS 106 on the costs of the average employer in the economy (including employers that do not offer post-retirement health benefits and/or are not affected by FASB's rules) is only 28.3% of the corresponding impact on TELCO. In addition, the Actuarial Analysis finds that SFAS 106 directly increases labor costs by 3% for the average employer offering post-retirement health benefits covered by SFAS 106. This 3% figure is an important input to the Macroeconomic Analysis.

Macroeconomic Analysis

The purpose of the Macroeconomic Analysis is to determine the extent to which the additional costs resulting from SFAS 106 would be passed through to an increase in GNP-PI. The Macroeconomic Analysis utilizes a macroeconomic model developed for Godwins by Professor Andrew Abel of the Wharton School of the University of Pennsylvania to address this question. The Macroeconomic Analysis finds that only 2.3% of direct SFAS 106 costs of the average employer in the economy are passed through to the GNP-PI. In addition, as a result of SFAS 106 the average wage rate in the economy would be 0.93% lower than it would have been in the absence of SFAS 106.

Effects of SFAS 106 on TELCO's Costs

As noted, the ultimate purpose of the study is to determine the extent to which GNP-PI reflects the additional costs incurred by the average Price Cap LEC (i.e. TELCO) as a result of SFAS 106. The table shown on page 2 summarizes our findings. Item (A) summarizes the Actuarial Analysis which finds that costs of

the average company in the economy increase by only 28.3% as much as TELCO's costs increase as a result of SFAS 106. Because only 2.3% of the average increase in costs is passed through to the GNP-PI (item (B)), only 0.7% (item (C), 2.3% x 28.3%) of TELCO's additional costs resulting from SFAS 106 are reflected in GNP-PI. Thus, it would appear that 99.3% of TELCO's additional costs are left unrecovered. However, the Macroeconomic Analysis finds that the national wage rate would eventually be 0.93% lower than it would have been in the absence of SFAS 106. If TELCO were able to benefit from a similar reduction in its wage rate, such a reduction would recover an additional 14.5% of TELCO's direct SFAS 106 costs (item (D)). Taking account of the 0.7% recovery due to GNP-PI and the eventual 14.5% recovery due to the adjustment of the wage rate leaves 84.8% of TELCO's direct SFAS 106 costs unrecovered (item (E)).

II. DEVELOPMENT AND SUMMARY OF RESULTS

We wish to establish what percentage of the average Price Cap LEC's SFAS 106 costs will be reflected in the GNP-PI and hence what percentage will not be so reflected.

We begin with an actuarial analysis which proceeds in two steps. The first step in the actuarial analysis is to construct a composite company which accurately reflects the characteristics and benefit plans of the average Price Cap LEC. The second step is to determine the impact of SFAS 106 on this composite company relative to the impact of SFAS 106 on other employers in the GNP on the assumption that all additional costs are passed on completely into the GNP-PI. Following the actuarial analysis is a macroeconomic analysis to determine the extent to which the additional costs will, in fact, translate into higher prices and, therefore, affect the GNP-PI.

Construction of Composite Company ("TELCO")

Actuarial, benefit, economic and demographic data were collected on eleven Price Cap LECs. Data included was for total Telephone Operations consistent with amounts included on the 1990 ARMIS 43-02 for each Company. These data were then combined, treating each Price Cap LEC as if it were a division of the larger combined company. The characteristics of this composite company ("TELCO") are as follows:

Number of Active employees	613,193
Number of Retired employees:	294,482
1990 Average compensation per employee:	$38,533
1990 Total Revenue (in millions):	$82,512.9
1990 Total Value Added (in millions):	$61,338.4
Average Per Capita Claims Cost:	$3,075
Average Age of Actives:	41.6
Average Service of Actives:	16.6

Impact of SFAS 106 on the Average Price Cap LEC Relative to its Impact on All Employers in the GNP

There are 95.8 million private sector employees and 18.6 million public sector employees in 'GNP', all of whom (and their dependents) may incur medical charges in retirement. Public sector employers, however, will not record SFAS 106 expense even where the entity sponsors a post-retirement medical plan (public sector employers are not subject to FASB rules).

Of the private sector employees, 30.7 million are eligible to have a proportion of their charges in retirement met by their employer's medical plan (and which plan is subject to SFAS 106), the actual proportion depending on the detailed provisions of their employer's plan(s). It is this anticipated employer cost for those employees that is reflected in SFAS 106 costs. The proportion of the charges met is an effective measure of the overall level of benefit provided by a given plan. We will refer to it as the Benefit Level Indicator ("BLI"). We must establish the average proportion of covered employees' charges that will be met collectively by their employers - the GNP BLI.

Separately we will calculate the average proportion of charges met by the average Price Cap LEC - the TELCO BLI.

All other factors being equal (which they are not), the percentage of TELCO's SFAS 106 costs that would be reflected in the GNP-PI would be represented by the following ratio:

$$\text{BLI Ratio} = \frac{\text{GNP BLI}}{\text{TELCO BLI}} = \frac{\text{Benefit Level Indicator for the average employer in the GNP}}{\text{Benefit Level Indicator for TELCO}}$$

However, this ratio requires a number of adjustments:

- Adjustment for differences in demography which will affect the SFAS 106 impact of a given program (Demographic Adjustment).

- Adjustment for the differing impact on SFAS 106 costs of current retirees at TELCO compared with other employers (Current Retiree Adjustment).

- Adjustment for any differences in the extent to which TELCO is pre-funding its post-retirement benefits compared to other employers (Pre-Funding Adjustment).

- Adjustment for employees not covered by post-retirement medical programs or covered by programs for which SFAS 106 will not apply (Non-Covered Employees Adjustment).

- Adjustment for differences between per unit labor costs for TELCO and for other employers (Per Unit Labor Cost Adjustment).

- Adjustment for differences in the percentage of total output represented by labor costs for TELCO and for other employers (Labor Cost Percentage Adjustment).

Utilizing the data, methods, and assumptions described in Section III, we have determined the following values:

(1) GNP BLI = .2568

(2) TELCO BLI = .4390

(3) BLI Ratio = .2568 + .4390 = .5850

(4) Demographic Adjustment = .5438

(5) Current Retiree Adjustment = .9287

(6) Pre-Funding Adjustment = 1.313

(7) Non-Covered Employees Adjustment = .2684

(8) Per Unit Labor Cost Adjustment = 1.3062

(9) Labor Cost Percentage Adjustment = 2.0832

(10) SFAS 106 Cost Increase Ratio = BLI Ratio x (4) x (5) x (6) x (7) x (8) x (9) = .2833

The SFAS 106 Cost Increase Ratio can be interpreted as meaning that, at most, only 28.3% of the additional cost incurred by TELCO due to SFAS 106 will find its way into the GNP-PI because the average employer in the GNP will experience only 28.3% of the cost increase that will hit TELCO.

Extent to which Impact of SFAS 106 on All Employers in GNP Translates into an Increase in the GNP-PI

The effect of SFAS 106 on the GNP-PI is calculated using a macroeconomic model that has two sectors. In sector 1 employers do not offer post-retirement health benefits, and in sector 2 employers do offer post-retirement health benefits. The macroeconomic model treats the introduction of SFAS 106 as a direct increase in the cost of labor facing employers in sector 2. The baseline calculations using the model calculate the impact of SFAS 106 on the GNP-PI using the following information:

(1) sector 2 accounts for 32% of private sector employment;

(2) labor costs account for 64% of total costs in sector 1 and in sector 2; and

(3) SFAS 106 directly increases labor costs by 3% in sector 2.

Based on these inputs, numerical solution of the macroeconomic model indicates that SFAS 106 will increase the private sector price index by 0.0138%.

To put this result in perspective we calculate a back-of-the-envelope estimate of the effect of SFAS 106 on the private sector price index as follows: a 3% increase in labor costs raises total costs and prices in sector 2 by 1.92% (64%

share of labor costs in total costs x 3% increase in labor costs) and thus raises the private sector price index by 0.614% (1.92% increase in price in sector 2 x 0.32 share of sector 2 in private sector GNP). Thus, if all direct costs were completely passed through in prices, and if there were no change in the amount of labor employed and output produced by each employer, the private sector price index would increase by 0.614%. However, taking account of the impact of labor costs on the demand for labor, and the impact of price changes on the demand for goods, the macroeconomic model finds that the private sector price index increases by only 0.0138%. We define the "passthrough coefficient" as the increase in the price index according to the macroeconomic model divided by the back-of-the-envelope price increase. In the baseline calculation, the passthrough coefficient is 0.0225 (0.0138% ÷ 0.614%). The passthrough coefficient can be thought of as the percentage of national SFAS 106 costs that will actually be reflected in the private sector price index.

The GNP-PI covers prices of government sector production as well as prices of private sector production, with the government sector accounting for 10.6% of GNP and the private sector accounting for 89.4% of GNP. Because SFAS 106 does not apply to the government sector, the government component of the GNP-PI will not be affected by SFAS 106. Therefore the increase in the GNP-PI equals 89.4% of the increase in the private sector price index. This factor of 89.4% applies both to the back-of-the-envelope price increase and to the price increase calculated by the macroeconomic model. Thus, the back-of-the-envelope increase in the GNP-PI is 0.549% (0.894 x 0.614%) and the increase in the GNP-PI according to the macroeconomic model is 0.0124% (0.894 x 0.0138%). The passthrough coefficient is 0.0225 (0.0124% ÷ 0.549%) which is identical to the passthrough coefficient for the private sector price index.

Resulting Impact of SFAS 106 on TELCO Relative to its Overall Impact on the GNP-PI

As noted above, the average employer in the GNP will experience only 28.3% of the cost increase that TELCO will experience due to SFAS 106. Furthermore, we have seen that only 2.3% of the cost increase experienced by all employers in the GNP will be passed through to the GNP-PI. From the interaction of these factors we

are able to conclude that only 0.7% of TELCO's SFAS 106 costs will be reflected in the GNP-PI and that 99.3% of these additional costs will not be reflected in this price index.

Additional Macroeconomic Effect of SFAS 106

In addition to the result reported above our macroeconomic model indicates that, in response to the impact of SFAS 106, the wage rate in the national economy will, over time, reduce in relative terms by 0.93% (i.e., relative to what it would have been in the absence of SFAS 106). To the extent that TELCO could also benefit from a relative reduction in its wage rate this would help to offset its increase in costs due to SFAS 106. If TELCO were able to achieve the full reduction of 0.93% this would finance 14.5% of its additional SFAS 106 costs. As noted, this wage rate reduction reflects the ultimate effect of SFAS 106 and would not necessarily fully occur in 1993 when SFAS 106 becomes effective.

Thus the combined effect of the impact of SFAS 106 on the GNP-PI and on the wage rate would still leave 84.8% of TELCO's additional SFAS 106 costs unrecovered.

III. DETAILED DESCRIPTION OF ANALYSIS

Impact of SFAS 106 on the Average Price Cap LEC Relative to its Impact on All Employers in the GNP

This section of our report is a re-iteration of Section II but with considerably more detail.

Construction of Composite Company ("TELCO")

As noted earlier, eleven Price Cap LECs submitted data for this study. Each firm informed us of its number of active employees and their average ages and average service, and of the number of its retirees covered by employer subsidized Medical Plans. We were also provided detailed descriptions of the Medical Plans for Retired Employees and of the results of actuarial studies of the impact of SFAS 106 on expensing for these Plans.

Our data included a distribution by quinquenial age and service cells for 125,000 active employees, and we used the shape of this distribution for the valuations needed for this report. The distribution was shifted as required, to fit the known average age and average service for all of the Price Cap LECs. A census was constructed from the adjusted distribution, which census represents the typical Price Cap LEC.

A Benefit Level Indicator was determined for each Plan. As noted earlier, this Benefit Level Indicator measures the relative value of individual plans. The methodology for calculating the Benefit Level Indicator for a given retiree medical plan is discussed in detail beginning on page 12. The Indicators were averaged and a Plan with the average Benefit Level Indicator was used for this study. As expected, the actuarial assumptions used for the calculation of the impact of SFAS 106 differed from study to study.

The discount rate was a single number for all but 1 of the 11 Price Cap LECs (an equivalent uniform rate was proffered for the one exception) and the discount rate for the composite firm, TELCO, was taken as the average of the individual rates, weighted by number of active employees. Simple averages could not be used for turnover assumptions or retirement decrements because such rates are one or two dimensional arrays. Therefore TELCO turnover was derived by doing valuations of a standard Plan using each firm's turnover rates, the TELCO census, and a standard retirement age. The turnover table for TELCO was taken from a collection of standard turnover tables used for Pension Valuations, and was selected as that table which when used with the TELCO census, standard Plan and standard retirement age gave the best agreement as to the SFAS 106 liabilities as determined by the aggregation of individual firm's actuarial studies.

The composite retirement age assumption for TELCO was derived by setting a pattern for each firm, which pattern gave the same average retirement age for an employee attaining age 55, ignoring mortality, as given by the retirement age assumptions used for the actuarial studies. These patterns had one free parameter (the level rate to be applied for ages 55 to 61), and the composite pattern was that pattern with the average value of the free parameter. TELCO's trend rates were derived using an analysis similar to that used for determining TELCO's retirement rates. We used an ultimate trend rate equal to the average of ultimate trends rates used in the actuarial studies. We then determined a value for an initial trend rate for each Price Cap LEC such that a declining pattern of trend rates beginning with that initial trend rate and grading down to the average ultimate trend rate gave the same present value for a 30-year stream of projected claims payments as would be obtained by using the actual trend rates assumed in that Price Cap LEC's actuarial study. The composite trend assumption for TELCO was the pattern associated with the average initial trend rate grading down to the previously determined average ultimate trend rate.

Calculation of GNP BLI and TELCO BLI

We define the Benefit Level Indicator ("BLI") to mean the percentage of total medical claims incurred by an employer's retirees that will be reimbursed by the employer's benefit program. This definition applies only to the plan for which the employer's active employees may become eligible and the BLIs are based only on current levels of medical costs and Medicare reimbursement. We consider only current levels because the SFAS 106 requirement to value the "substantive" plan suggests that it is reasonable to assume that plan provisions (e.g., deductibles, out-of-pocket maximums, etc.) will generally be projected (either explicitly or implicitly) to stay consistent with aggregate cost levels. In general, the liability for current retirees is already being expensed on a pay-as-you-go basis and is a function of prior plan provisions. As noted earlier, the impact of current retirees on SFAS 106 costs is taken account of in the Current Retiree Adjustment.

Thus, in order to calculate the BLI of a given employer's post-retirement medical plan one needs the plan provisions and an anticipated frequency distribution of medical charges broken down by type of charge and size of charge.

The calculation itself is very detailed, but relatively straight forward. For each type and size of annual claim pre- and post-65 (e.g., hospital charges between $5,000 and $6,000 incurred before age 65), the plan's provisions (i.e., deductible, coinsurance, etc.) are applied and a plan reimbursement amount is calculated, allowing for any integration with Medicare benefits.

After all plan reimbursement amounts are calculated, the frequency distribution is applied to calculate an overall average reimbursement ratio compared to total medical charges. This ratio is then adjusted for the amount of required retiree contributions called for by the plan. The result is the net BLI. Because of the significant differences between plan provisions that apply to retirees pre- and post-65 (Medicare integration, contribution levels, etc.), two BLIs are calculated, pre- and post-65. These two BLIs are then weighted to generate an overall BLI for the employer.

As noted above, the calculation of an employer's BLI requires both a data base of employer plan provisions and a detailed medical claims distribution. With respect to plan provisions, we have utilized a data base of over 1,000 employers which includes 830 employers who sponsor post-retirement medical programs. For each of these employers, we have detailed plan provisions which include for pre- and post-65 coverage for each type of medical charge (surgery, hospital, physicians, drugs, etc.):

- Eligibility requirements
- Deductible
- Coinsurance
- Out-of-pocket maximums
- Plan reimbursement maximums (annual and lifetime)
- Required contributions for employee and dependent coverage
- Type of Medicare Integration

The data base includes only limited information on dental coverage and no information on post-retirement life insurance. The data base itself is comprised mostly of large employers with over 1,000 employees and is distributed throughout all six of the major industry categories outlined by the General Accounting Office in its recent survey of the prevalence of post-retirement medical programs. In total, the data base covers approximately 19 million of the estimated 38 million employees who work for employers who sponsor post-retirement medical programs. A summary of the data base appears in Appendix A.

With respect to the distribution of medical claims, we utilized a distribution based on the actual 1990 experience of 39,436 retirees (pre- and post-65) covered by employer sponsored post-retirement medical plans administered by one large national insurance company. The data includes detailed breakdowns of claim amounts by size and type of claim. It covers plans throughout the United States and, to our knowledge, does not have any geographic or industry bias.

To derive GNP-BLI, Benefit Level Indicators were calculated for each employer in the data base, then a comparison was made between our data base of large employer plans and the employers who make up the GNP. In making that comparison, we

utilized information from the United States General Accounting Office March 1990 Report on "Extent of Companies Retiree Health Coverage", including unpublished supporting data obtained directly from the GAO staff. In particular, average BLIs by industry (weighted by number of employees) were determined from our data base. These average BLIs were then weighted by the percentages of covered employees working in each major industry as determined by the GAO survey. These weighted values were then averaged to come up with BLIs for the GNP for pre-65 and post-65 coverage separately. The pre- and post-65 BLIs were then weighted, based on the average demographics and retirement experience of the national workforce, to produce GNP-BLI.

TELCO in total sponsors 18 post-retirement medical programs (i.e. one or more for each of the Price Cap LECs). The same BLI calculation process described above was utilized to determine the pre- and post-65 Benefit Level Indicators for each of the 18 employee groups. These 18 sets of BLIs were then combined on an employee weighted basis to derive pre- and post-65 BLIs for TELCO as a whole. The pre- and post-65 BLIs were then weighted and combined on the basis of national average demographics and retirement patterns to produce TELCO BLI. The numerical derivation of GNP BLI and TELCO BLI is outlined below.

Calculation of Benefit Level Indicator for Average Employer in GNP

1. Calculate pre- and post-65 BLIs by industry from data base.

Industry	*Pre-65 BLI*	*Post-65 BLI*
Mining & Manufacturing, etc.	*.7232*	*.2340*
Construction	*.7758*	*.0604*
Transportation/Utilities	*.7974*	*.2643*
Retail	*.4730*	*.0603*
Finance/Insurance	*.6721*	*.1926*
Consumer Services	*.5771*	*.1267*

2. Calculate industry weighted average BLIs using industry weightings from GAO study. (See Appendix A for industry weightings from GAO study)

Industry Weighted Average BLI Pre-65 = .6898

Post-65 = .2008

3. Calculate GNP BLI based on national demographics (retirement age = 63). (See Appendix B for methodology for determination of pre- and post-65 weightings)

GNP BLI = .2568

Calculation of Benefit Level Indicator for TELCO

1. Calculate pre- and post-65 BLIs for each plan sponsored by TELCO:

Weighted Average Benefit Level Indicators for TELCO

Pre-65	=	.8295
Post-65	=	.3885

2. Calculate TELCO BLI based on national demographics:

TELCO BLI = .4390

Calculation of Demographic Adjustment

Even if the Benefit Level indicators of the GNP were equal to that of the average Price Cap LEC (i.e. if GNP BLI were equal to TELCO BLI), they would not necessarily generate the same anticipated retiree claim cost per active employee. If TELCO employees exhibit different turnover than other employees in the GNP, a different percentage of TELCO's employees will reach retirement. This will result in a different retiree claim cost per active employee. As can be seen from Appendix A, TELCO will in fact utilize lower rates of turnover than those

used by other employers in determining SFAS 106 costs. Because of this an adjustment of *.7788 (Turnover rate adjustment)* will need to be applied to the BLI ratio.

Furthermore each $1 of TELCO anticipated claim cost will not translate into the same amount of SFAS 106 cost as will each $1 of anticipated retiree claim cost in the GNP. This will be due to two types of demographic differences between TELCO and the GNP. In particular:

- TELCO employees are older and have more past service than those in the GNP.
- TELCO employees tend to retire at earlier ages than is true throughout the national economy.

The extent of these differences is illustrated in Appendix A, and will give rise to the following additional adjustments to the BLI ratio:

Adjustment due to age and past service differences = .8528 (age/service adjustment)
Adjustment due to earlier retirements among TELCO employees = .8188 (retirement rate adjustment)

The total demographic adjustment is derived as (turnover rate adjustment) x (age/service adjustment) x (retirement rate adjustment):

Demographic Adjustment = .7788 x .8528 x .8188 = .5438

The specific methods and assumptions utilized in the derivation of the above adjustment are described in Appendix B. In developing this as well as all future adjustments methodology was employed to ensure that no "double counting" of effects occurred.

Calculation of Current Retiree Adjustment

Because a significant portion of SFAS 106 costs will arise due to the amortization of the liability for current retirees we must allow for the possibility that the relative SFAS 106 cost impact of these current retirees will be different for TELCO than for the GNP. In order to address this, we calculated and compared the average current retiree benefit cost per active employee for TELCO and for the GNP (using for the GNP only the 30.7 million active employees who generate SFAS 106 costs).

For TELCO the average claim cost per current retiree is $3,075 while for the GNP it is $1,802. Furthermore the ratio of current retirees to active employees at TELCO is .4802 compared with .1726 for the GNP. Thus the ratio of current retiree cost per active employee of the GNP to that of TELCO is (.1726 x 1802) + (.4802 x 3075) or .2106.

If the BLI ratio after applying Demographic Adjustment was also .2106 then no further adjustment would be required. However, the BLI ratio after the Demographic Adjustment is .3181 (.5850 x .5438). Current retirees at TELCO represent 21.09% of the increase in costs due to SFAS 106 and active employees represent the other 78.91%. Taking this into account, we calculate:

$$\textit{Current Retiree Adjustment} = .7891 + (.2109 \times .2106 + .3181) = .9287.$$

Calculation of Pre-funding Adjustment

Thus far we have assumed that the increase in labor costs due to SFAS 106 for both the GNP and TELCO will equal expense calculated under SFAS 106 minus claim cost for current retirees (i.e. current "pay as you go" cost). If, however, either TELCO or employers in the GNP have been funding and/or accruing expense for post-retirement medical benefits in excess of "pay as you go" cost, then an adjustment must be made. In fact several of the Price Cap LECs have accumulated and are continuing to accumulate assets in trust to pay future post-retirement medical benefits. Therefore the increase in TELCO's labor costs due to SFAS 106 will be less than it would be had no pre-funding taken place. By making the

conservative assumption that no similar accumulation of assets is taking place in the GNP, we calculate an adjustment equal to the increase in TELCO's labor cost if no pre-funding was taking place divided by the increase in TELCO's labor cost taking into account both accumulated assets and ongoing annual pre-funding contributions. Specifically the adjustment was determined as:

> (1991 TELCO SFAS 106 Cost assuming no prior funding - 1991 projected claims payment) ÷ (1991 TELCO SFAS 106 Cost recognizing prior funding - 1991 projected claims payment + additional 1991 funding costs).

Therefore, expressing all amounts in $millions:

Pre-funding Adjustment = (2,858.4-905.5) ÷ (2,693.1-1,205.8) = 1.313

Calculation of Non-Covered Employees Adjustment

Thus far, we have developed a BLI ratio and a set of adjustments that relate to those employees who generate SFAS 106 costs. We must still adjust this ratio to reflect the fact that while TELCO extends its post-retirement medical programs to its entire workforce, there are employers in the GNP who provide benefits to only a portion of their workforce and many employers who do not provide any post-retirement medical benefits at all. Finally, we must allow for public sector employees, none of whom generates SFAS 106 costs. In fact, the Non-Covered Employee Adjustment is simply the percentage of all employees in the GNP who could become eligible for post-retirement medical benefits programs sponsored by their employers which are subject to SFAS 106.

As can be seen in Appendix A, the US General Accounting Office performed a detailed survey in 1990 to determine the extent of post-retirement medical coverage provided by US employers in the private sector. The study concluded that of the 95.8 million private sector employees, 38.5 million work for employers who provide post-retirement medical benefits, but only 30.7 million of these 38.5 million employees could actually become eligible for benefits affected by SFAS 106, with the remaining 7.8 million being ineligible because they work for non-covered subsidiaries, work in non-covered job classes, or are covered by

multi-employer plans which are not subject to SFAS 106. Since government entities are also not subject to SFAS 106 (but are part of GNP), we must adjust for all public sector employees who number 18.6 million. Thus we calculate:

Non-Covered Employees Adjustment = 30.7 ÷ (95.8 + 18.6) = .2684

Calculation of Per Unit Labor Cost Adjustment

Adjustments made thus far have taken account of the fact that employers with the same Benefit Level Indicator may have different SFAS 106 costs per employee. However, even if SFAS 106 costs per employee were the same, labor costs per employee may not be and thus the relative impact of SFAS 106 on per unit labor costs may not be the same.

In fact, the labor costs per employee are significantly higher at TELCO than for other employers in the GNP. This is due, in part, to demographic differences but is also due to the different mix of skilled and unskilled workers at TELCO compared to the average mix in the GNP. As shown in Appendix A, TELCO's total annual compensation per employee is $38,533 as compared to the national average of $29,500. Therefore, to reflect the fact that each $1 of per employee SFAS 106 cost will represent a smaller portion of total labor costs for TELCO than for the GNP, we calculate,

Per Unit Labor Cost Adjustment = 38,533 ÷ 29,500 = 1.3062

Calculation of Labor Cost Percentage Adjustment

Even after applying the Per Unit Labor Cost Adjustment we must address the possibility that the percentage of output represented by labor costs may differ between TELCO and the GNP. If this is so, then even if SFAS 106 had the same percentage impact on the labor costs of both TELCO and the GNP, there would be a difference in its impact on the total costs of each. Unlike the explicit nature of the calculation of the other Adjustments, the Labor Cost Percentage Adjustment has to be calculated implicitly as explained below.

For the economy as a whole output is synonymous with value added (which is total revenue minus the cost of purchased inputs) and labor costs represent 64.27% of total output. For TELCO output consists of the cost of goods plus value added: the cost of goods is 25.7% of output and value added is 74.3% of output. Labor costs at TELCO are $23,623.7M and represent 38.5% of value added.

The impact of SFAS 106 on TELCO's costs is both direct and indirect. The direct impact is the increase in TELCO's own labor costs: the indirect impact is the effect on the labor costs of TELCO's suppliers which is passed on in the prices they charge TELCO for goods.

Before calculating Labor Cost Percentage Adjustment we calculate the

Adjusted BLI Ratio = BLI Ratio x all Adjustments
= .5850 x .5438 x .9287 x 1.313 x .2684 x 1.3062
= .1360

This Adjusted BLI Ratio can be interpreted as meaning that for every percentage point by which SFAS 106 increases TELCO's own labor costs it will increase the labor costs of the average company in the GNP by 13.60% of a percentage point.

On the assumptions that TELCO's suppliers are like the average company in the GNP and that all additional costs will be passed through completely into prices (and into the GNP-PI) an increase of one percentage point in TELCO's own labor costs will increase TELCO's overall costs:

- by 1% of 38.5% of 74.3% of output in respect of its own labor costs, and *(i.e., 1% of the percent of output represented by TELCO's labor costs)* = .2861% of output

- by .1360% of 64.27% of 25.7% of output in respect of its suppliers' prices *(i.e., by .1360% of the percent of output represented by TELCO's suppliers' labor costs)* = .0225% of output

- for a total of .3085% of output

The corresponding increase in the GNP-PI will be

.1360% of 64.27% of output = .0874% of output

Thus the GNP-PI would reflect only .0874 ÷ .3085 or 28.33% of the additional costs incurred by TELCO due to SFAS 106. The Labor Cost Percentage Adjustment has increased the factor of .1360 to a factor of .2833 thus:

Labor Cost Percentage Adjustment = .2833 ÷ .1360 = 2.0831

Extent to which Impact of SFAS 106 on All Employers in the GNP Translates into an Increase in the GNP-PI

In this section we describe the results obtained from a macroeconomic model developed to calculate the impact of SFAS 106 on the GNP-PI.

Motivation for the Macroeconomic Model

The macroeconomic model we use allows us to calculate the impact of SFAS 106 on prices in all sectors as well as the effect on the overall GNP-PI. We can get a simple view of how the price level is affected, as well as an appreciation of the need for a macroeconomic model, by first considering a "back-of-the-envelope" calculation of the effects of SFAS 106 on the price level. To make the interpretation of the calculation as simple as possible, suppose that in the absence of SFAS 106 the GNP-PI would remain constant over time; that is, the rate of inflation would be zero. Later we will consider the more realistic scenario in which there is ongoing inflation in the absence of SFAS 106.

The back-of-the-envelope calculation involves two steps:

(1) the percentage increase in the price of goods in a given sector equals the percentage increase in the cost of a unit of labor multiplied by the share of labor cost in total costs in that sector; and

(2) the percentage increase in the overall price index is calculated as the weighted average of the price increases in each sector.

As an example suppose that the economy is divided into two sectors. One sector, accounting for 68% of GNP pays no post-retirement health benefits and its costs per unit of labor are not directly affected by SFAS 106. In the second sector, which accounts for 32% of GNP, SFAS 106 directly increases the cost per unit of labor by 3%, and labor costs account for 64% of total costs. According to the back-of-the-envelope calculation, total costs and prices will increase by 1.92% (64% of 3%) in the second sector, and the overall price index will increase by .614% (32% of 1.92%). However, as we discuss below, this calculation overstates the effect on the overall price level.

Why does the back-of-the-envelope calculation overstate the size of the increase in the overall price level? The introduction of SFAS 106 will increase the cost of labor for employers who offer post-retirement health benefits and this increase in cost will lead to a variety of market adjustments. Although the full scope of market adjustments and their interactions can be complex (as detailed in Appendix C) we can get a simple view of the effects by first examining the effects in the labor market.

Because SFAS 106 increases the labor costs of employers who offer post-retirement health benefits, these employers will demand a smaller amount of labor at any given level of the wage rate. This reduction in the demand for labor will reduce the wage rate (not including post-retirement health benefits) facing all employers. The reduction in the wage rate will reduce labor costs of employers who do not offer post-retirement health benefits. Labor costs of employers who do pay post-retirement health benefits will increase by less than the direct impact of SFAS 106 on labor costs captured in the back-of-the-envelope calculation. With competition forcing prices to stay in line with costs, prices will fall in the sector that does not offer post-retirement health benefits and prices will rise by less than in the back-of-the-envelope calculation for employers who offer post-retirement health benefits. With prices rising in one sector and prices falling in the other sector, the overall price level may change by only a small amount.

Although the overall price level may change very little, the relative price of goods in the two sectors may change substantially to reflect the change in the relative labor costs arising from the differential impact of SFAS 106 on employers who offer post-retirement health benefits and employers who do not offer these benefits. In addition to effects we have already discussed, changes in labor costs arising from SFAS 106 will affect the mix of capital and labor used by employers in different sectors, and resulting changes in the prices of goods will shift demand away from the sector with an increased price toward the sector with a decreased price. The shift in demand will cause a reallocation of resources from one sector to the other. All of these additional adjustments are captured by the macroeconomic model which is used to get a quantitative measure of the impact of SFAS 106 on the prices of goods in each sector as well as on the GNP-PI.

Now let's consider the more realistic scenario in which there is ongoing inflation before the introduction of SFAS 106. Over the long run, the price level is very strongly related to the level of the money supply, and the rate of inflation is very strongly related to the growth rate of the money supply. With ongoing money growth there will be ongoing inflation, and the question is how much SFAS 106 affects the price level compared to the value it would have reached in the absence of SFAS 106. The basic results we presented above still hold, but with a slight re-interpretation: Whenever we said that a price increases, we now mean that it increases relative to the level it would have attained in the absence of SFAS 106; whenever we said that a price or wage decreases, we mean that it decreases relative to the level it would have reached in the absence of SFAS 106. Thus, for example, if we find that in the absence of ongoing inflation, SFAS 106 would reduce the wage by 2%, then in the presence of ongoing inflation of 5% per year, the wage would rise by 3% over the course of the year, so that it ends up 2% below the value it would have attained in the absence of SFAS 106 (if the effects of SFAS 106 were fully realized within one year). Thus, when we report that SFAS 106 causes some prices and wages to fall, we mean only that these prices and wages are lower than they would have been without SFAS 106 -- not necessarily that we will observe actual declines in these prices and wages

between one date and some later date. This focus on the effect of SFAS 106 on prices and wages relative to values they would have reached is the correct focus for analyzing the question at hand: What is the impact of SFAS 106 on the GNP-PI?

We have explained that SFAS 106 will cause some prices to rise and other prices to fall relative to their values in the absence of SFAS 106. To get a quantitative measure of this effect we use a mathematical macroeconomic model.

Modeling Strategy

To study the quantitative impact of SFAS 106 on the GNP-PI we use a mathematical macroeconomic model that incorporates production costs for various goods and national demands for these goods. The impact of SFAS 106 is modeled as a direct increase in the cost of labor of employers who offer post-retirement health benefits, and the solution of the model indicates the ultimate effects on the prices of various goods and on the private sector price index. The model is best viewed as a long-run model that fully incorporates the effects of SFAS 106.

Before constructing a macro model to study the price impact of SFAS 106, it is helpful to list a set of desirable criteria for a macro model that can be used to analyze this question. First, the model should be a multi-sector model because SFAS 106 will have different direct impacts on different sectors. In particular, SFAS 106 will directly increase the cost of labor of employers who offer post-retirement health benefits (which we treat as sector 2), but will have no direct impact on employers who do not offer post-retirement health benefits (which we treat as sector 1).

Second, the model should explain how the costs of production are related to the cost of labor and other inputs. At the same time, the model should allow for the possibility that capital may be substituted for labor when labor becomes more expensive as it does in the SFAS 106 sector, and the model should also allow for the possibility that labor may be substituted for capital when labor becomes less expensive as it does in the sector that does not offer post-retirement health benefits.

Third, the model should provide a specification of the aggregate demand for goods related to the overall price index as well as the demands for the different goods produced in the different sectors. Combining the demand structure with the cost structure will permit calculation of the impact of cost changes in each sector on quantities, and more importantly, on prices. Then the price index can be computed.

Fourth, the model should be tractable so that numerical solutions can be computed and readily interpreted.

Fifth, the model should be internally consistent and based on sound economic foundations.

The criteria listed above for an appropriate model guide our choice of a model. To that end, we have developed a macroeconomic model that draws heavily on the model presented in an article published by two prominent macroeconomists -- Olivier Blanchard of M.I.T. and Nobuhiro Kiyotaki of the University of Wisconsin -- in the September 1987 American Economic Review. This article presents a multi-sector macroeconomic model that explicitly accounts for production and cost conditions as well as aggregate demand. Although the model is economically sophisticated and requires some mathematical manipulation to solve, the basic structure is quite tractable. Finally, the model has the advantage of being based on sound economic principles and is internally consistent.

The precise mathematical structure of our adaptation of the Blanchard-Kiyotaki model is presented in Appendix C. Here we will simply describe the three major components of the model:

(1) the demand for goods;

(2) the production functions;

(3) the supply of labor.

(1) The demand for goods. The model is a two-sector model, which means that there are two types of goods. If the relative prices of the goods are held constant, the demand for goods is proportional to the overall level of aggregate demand which depends on the money supply and the overall price level. Changes in the relative price of the two goods shift demand away from the good with the increased relative price toward the good with the decreased relative price. The degree to which demand is shifted is measured by the price elasticity of demand, which is an input to the model.

(2) The production functions. Each type of good is produced using capital and labor. The amount of output that can be produced with any given combination of capital and labor is determined by a Cobb-Douglas production function. The Cobb-Douglas production function is one of the most widely used production functions in economics. Its most important characteristic is that for a competitive company, the share of labor cost in total cost is constant, regardless of the wage rate or the amount of output produced. In applying the model to the United States we specify particular Cobb-Douglas production functions that match the share of labor cost in total cost in the U.S. economy.

(3) The supply of labor. We have already pointed out that the introduction of SFAS 106 will reduce the demand for labor by firms offering post-retirement health benefits, and as a consequence, will reduce the wage rate relative to the level that would have prevailed in the absence of SFAS 106. The magnitude of the effect on the wage rate depends on the response of labor supply to the change in labor demand. The model characterizes the supply of labor in terms of the elasticity of labor supply with respect to the wage rate which measures the percentage fall in the amount of labor supplied resulting from a 1% fall in the wage rate.

To get quantitative results from the model, we must provide certain inputs to the model. Using these inputs, the mathematical macroeconomic model is solved numerically using a FORTRAN program written specifically for this model. In our baseline calculation we use the following values for the major inputs to the model:

Baseline Parameters

price elasticity of the demand for goods:	1.50
share of labor costs in total cost in sector 1:	0.64
share of labor costs in total cost in sector 2:	0.64
initial fraction of labor employed in sector 2:	0.32
direct impact of SFAS 106 on labor costs in sector 2:	0.03
labor supply elasticity	0.00

The price elasticity of demand of 1.5 is probably too high, but it was chosen because experimentation with the model indicated that the impact of SFAS 106 on the GNP-PI increases when the price elasticity of demand increases. Thus, using a value of 1.5 most likely overstates the impact on the GNP-PI.

The share of labor cost in total cost in each sector was set equal to 0.64 to match the actual share of labor cost in total GNP in the United States.

The value of 0.32 for the fraction of labor employed in sector 2 was chosen to match the fraction of U.S. private sector employees covered by SFAS 106. The macroeconomic model is intended as a model of the private sector, so the share of private sector employment covered by SFAS 106 is used for the fraction of employment in sector 2.

The value of 3% for the direct impact of SFAS 106 on labor costs is indicative of the impact of SFAS 106 on those employers who provide post-retirement medical benefits and was chosen to maintain consistency between TELCO SFAS 106 costs and

those assumed for all other employers who will incur SFAS 106 costs. Specifically this value was developed by multiplying TELCO's increase in labor costs due to SFAS 106 by all of the adjustments except for the Non-Covered Employees Adjustment and the Labor Cost Percentage Adjustment.

Finally, the value of the labor supply elasticity is set equal to zero. Empirical studies of labor supply (summarized in Chapters 1 and 2 of the Handbook of Labor Economics, North-Holland, 1986) typically find that in response to a permanent reduction in the wage rate men will tend to increase their labor supply and women tend to reduce their labor supply. That is, these studies typically find a negative labor supply elasticity for men and a positive labor supply elasticity for women. The model uses a value of the *aggregate* labor supply elasticity, which measures the response of aggregate labor supply (men plus women) to changes in the wage rate. The aggregate labor supply elasticity is an average of the negative labor supply elasticity of men and the positive labor supply elasticity of women. It is typically found to be close to zero, or even slightly negative (survey of uncompensated wage elasticities summarized in Table 3.5 of Mark R. Killingsworth, Labor Supply, Cambridge University Press, 1983). Because the impact of SFAS 106 on the GNP-PI is larger for higher labor supply elasticities, we set the labor supply elasticity equal to zero rather than slightly negative to guard against understating the impact on the GNP-PI.

Using the values listed above in our baseline calculation leads to an increase of 0.0138% in the private sector price index. For comparison, the back-of-the-envelope calculation for this case leads to an increase of 0.614% in the price index. It is useful to define the "passthrough coefficient" as the increase in the price index according to the model divided by the back-of-the-envelope price increase. In this case the passthrough coefficient is 0.0225 (0.0138% + 0.614%), which indicates that the increase in the private sector price index is only 0.0225 times as large as indicated by the back-of-the-envelope calculation.

Sectors 1 and 2 together comprise the private sector. The macroeconomic model treats the government sector as an independent sector with employment and output determined independently of the private sector. The effect of SFAS 106 on the GNP-PI equals the share of government sector value added in GNP (10.6%)

multiplied by the impact on government sector prices plus the share of private sector value added in GNP (89.4%) multiplied by the increase in private sector prices. Because the government is not subject to SFAS 106, the impact on government sector prices is zero. Therefore, the impact on the GNP-PI is 89.4% of the impact on the private sector price index. Thus the back-of-the-envelope calculation yields a 0.549% (0.894 x 0.614%) increase in the GNP-PI, and the baseline calculation indicates that the GNP-PI will increase by only 0.0124% (0.894 x 0.0138%). The passthrough coefficient for the GNP-PI is 0.0225 which is identical to the passthrough coefficient for the private sector price index.

The conclusion from the baseline calculation is very strong: <u>The impact of SFAS 106 on the GNP-PI is only a tiny fraction of the amount indicated by the back-of-the-envelope calculation</u>.

<u>Resulting Impact of SFAS 106 on TELCO Relative to its Overall Impact on the GNP-PI</u>

To calculate the resulting relative impact of SFAS 106 on the GNP-PI compared to TELCO, we return to the calculation of the Labor Cost Percentage Adjustment. This was based on the assumption that all additional costs will be passed through completely into prices (and into the GNP-PI) and we must now change that assumption to reflect the output of our macroeconomic model.

The model indicates that the GNP-PI will increase by 0.0124%.

Looking first only at the <u>direct</u> effect of SFAS 106 on TELCO, we find that the increase in TELCO's direct labor costs is 6.295%. Thus TELCO's costs will increase:

- by 6.295% of 38.5% of 74.3% of output = 1.8027% of output
  (i.e., by 6.295% of the percent of output represented by TELCO's labor costs)

Thus the GNP-PI would reflect only 0.0124 + 1.8027 or 0.69% of the additional direct costs incurred by TELCO due to SFAS 106.

Additional Macroeconomic Effects of SFAS 106

In addition to the result reported above our macroeconomic model indicates that, in response to the impact of SFAS 106, the wage rate in the national economy could eventually fall in relative terms by 0.926% (i.e., relative to what it would have been in the absence of SFAS 106). To the extent that TELCO could also benefit from a relative reduction in its wage, this could help to offset the increase in its costs due to SFAS 106. If TELCO were able to achieve the full reduction of 0.926% the effect may be calculated as explained below.

SFAS 106 increases TELCO's direct labor costs by	6.295%
If the national wage rate is, in fact, reduced TELCO's direct labor costs are reduced by	.926%
The net increase in TELCO's direct labor costs is	5.369%

Thus TELCO's overall costs would increase

- by 5.369% of 38.5% of 74.3 of output in respect of its own labor costs, *(i.e., by 5.369% of the percent of output represented by TELCO's labor costs)* = 1.5375% of output

- by 0.0124% of 25.7% of output in respect of its suppliers' prices *(i.e., by .0124% of the purchased inputs used by TELCO)* = .0032% of output

- for a total increase of = 1.5406% of output

Thus if TELCO could benefit from a relative wage reduction of .926%, its overall costs would increase by 1.5406% of output instead of the 1.8027% of output calculated earlier. This indicates that macroeconomic effects, including a possible reduction in TELCO's wage rate could finance a percentage of its additional SFAS 106 cost, calculated to be:

$$(1.8027 - 1.5406) \div 1.8027 = 14.53\%$$

Thus the combined effect of the impact of SFAS 106 on the GNP-PI (0.7%) and on other macroeconomic variables including the wage rate (14.5%) would still leave 84.8% of TELCO's additional SFAS 106 costs unrecovered.

IV. SENSITIVITY OF RESULTS

While we have attempted to calculate the results outlined previously in as accurate a manner as possible, it should be obvious that many of the results are subject to variability due to either the uncertainty of the underlying data or the need to make some assumptions about future or unknown factors. In this section we discuss the sensitivity of each of the previously derived values and of the aggregate result to reasonable variation in underlying data and/or assumptions.

The BLI Methodology

Initial Calculation of GNP BLI and TELCO BLI: In calculating GNP BLI and TELCO BLI there were two areas of uncertainty that we analyzed. With respect to the calculation of GNP BLI we utilized average BLIs by industry and then utilized industry weightings derived from the GAO survey to derive a final GNP BLI. Had we, instead, utilized an aggregate employee weighted average based on our data base only we would have derived GNP BLI as .2613 instead of .2568. This would have resulted in **increasing** the relative impact of SFAS 106 on GNP compared to TELCO from 28.3% to 28.7%. With respect to the calculation of TELCO BLI, the greatest area of uncertainty arose in deciding how to weight the various plans sponsored by each Price Cap LEC. We decided to weight them based on employee counts. We believe this was a conservative approach because in our data base only one set of plan provisions is maintained for each employer. If we assume that where an employer has more than one plan it is the more generous plan which is reported in the data base, then it would be appropriate to utilize only the more generous plans in calculating the TELCO BLI. If we had taken this approach it would have **reduced** the relative impact of SFAS 106 on GNP compared to TELCO from 28.3% to 27.7%.

Demographic Adjustment - We adjusted for the fact that TELCO will utilize lower rates of turnover than those used by other employers in determining SFAS 106 costs. It is hard to argue that the same pre-retirement withdrawal assumption should be made because TELCO's demographics are themselves the result of lower

turnover rates actually experienced by TELCO. However, if we were to assume the same withdrawal patterns for both TELCO and GNP (while retaining the different demographics), the relative impact of SFAS 106 on GNP compared to TELCO would increase from 28.3% to 34.6%.

The adjustment due to age and past service differences relies on demographic data provided by the separate Price Cap LECs and averaged into a single composite TELCO census having an average age of 41.6 with average past service of 16.6 years. If we were to reduce the age and service to 40.6 and 15.6 respectively, the relative impact of SFAS 106 on GNP compared to TELCO would increase from 28.3% to 29.7%.

A degree of uncertainty is also present in our adjustment due to earlier retirement among TELCO employees. This uncertainty arises in the determination of a national average retirement age assumption. We believe our use of age 63 was a conservative assumption in that the limited data on the subject (Gerontologist Vol. 28, No. 4) seems to indicate a national average retirement age between 63.5 and 64. Furthermore, if as expected, employers in the GNP tend to be aggressive (i.e., optimistic) in setting assumptions for accruing post-retirement liability, it might seem reasonable to utilize an age 64 assumption. If an age 64 assumption had been used the relative impact of SFAS 106 on GNP compared to TELCO would have been reduced from 28.3% to 25.6%.

Current Retiree Adjustment - The calculation of this adjustment is predicated on an average claim rate per retiree for the GNP of $1,802 and a ratio of retirees to covered actives of .1726. The claim rate was derived by taking the 1990 rate of $1,514 as reported in the Hewitt Associates Survey of Retiree Medical Benefits and increasing it by 19% for medical trend inflation. The ratio of retirees to covered actives was derived from the GAO study. While we believe 19% to be a realistic assumption for medical inflation, we recognize that the national average could actually have increased by more. If we assume a 25% increase in the average claim, to $1,892, and further assume that the actual ratio of retirees to actives has increased to .2 (from .1726) the relative impact of SFAS 106 on GNP compared to TELCO would increase from 28.3% to 29.2%.

Also, inherent in this Adjustment is the assumption that the demography of the current TELCO retiree is identical to that of the GNP. In fact, this too is a conservative assumption because TELCO employees generally retire at younger ages than the national average and thus the liabilities for TELCO will tend to be higher on this account than for the retirees in the national economy. If, however, we were to assume that retirees at TELCO were somewhat <u>older</u> than those in the GNP and hence generated SFAS 106 cost per $1 of retiree claim cost that was 10% less than that for the GNP, the relative impact of SFAS 106 on GNP compared to TELCO would only increase from 28.3% to 28.8%.

Pre-funding Adjustment - This adjustment looked at the effect of TELCO's existing pre-funding of post retirement medical benefits as compared with no pre-funding. By doing this we made the conservative assumption that there is no pre-funding in the GNP. If we assume there is pre-funding in the GNP to the extent that assets equal to one years claims have accumulated, and that annual contributions to such funds amount to claims plus 10%, the relative impact of SFAS 106 on GNP compared to TELCO would reduce from 28.3% to 26.2%.

Non-covered Employees Adjustment - This adjustment comes from the GAO survey which determined that 30.7 million private sector employees in the U.S. may eventually qualify to receive benefits under their employer's post-retirement medical plan. According to the GAO this estimate is subject to some sampling error and could be as high as 37.5 million or as low as 23.9 million. At the extremes this would cause the relative impact of SFAS 106 on GNP compared to TELCO to vary from 22.4% to 34.1% as compared to our determination of 28.3%.

Per Unit Labor Cost Adjustment - In calculating Per Unit Labor Cost Adjustment, allocated compensation and headcount were used. No sensitivity analysis was performed on this Adjustment because of the validity of the data used and the straightforward nature of the calculation.

Labor Cost Percentage Adjustment - In calculating the Labor Cost Percentage Adjustment we assumed that TELCO's suppliers were like the average company in the GNP. In particular we assumed that their labor costs were 64.27% of output and that their increase in labor costs was 13.60% of the corresponding increase for

TELCO. Had we assumed that they had no increase in labor costs due to SFAS 106 the relative impact of SFAS 106 on GNP compared with TELCO would have been 30.6% instead of 28.3%; had we assumed they would experience the same increase due to SFAS 106 as TELCO the relative impact would have been 19.3% instead of 28.3%.

The Macroeconomic Model

How robust is the conclusion drawn from the macroeconomic model in Section III? To answer this question we have examined the effect of varying each of the baseline parameters that constitute the major inputs to the model.

We indicated earlier that we believe the price elasticity of demand of 1.5 is probably too high and thus guards against understating the effect on the GNP-PI. Nonetheless we will show the effect of increasing the value of this parameter to 3.

For the economy as a whole labor costs are 64% of output and our baseline calculations assume that the same is true in each of the two sectors of our macroeconomic model. To test sensitivity we will show the results if, in each sector in turn, labor costs were as low as 50% of output or as high as 78% of output.

We used a fraction of labor employed in sector 2 of 0.32. This was based on the same numbers from the GAO survey as were used for the Non-Covered Employees Adjustment (30.7 million out of 95.8 million private sector employees). As indicated on page 36 the GAO calculated that due to possible sampling error the figure of 30.7 million could be as high as 37.5 million (39.1% of 95.8 million) or as low as 23.9 million (24.9% of 95.8 million). We will show the effect of using fractions of labor employed in sector 2 of 0.24 and 0.40.

As noted earlier, the direct impact of SFAS 106 on labor costs in sector 2 was taken to be +3%. The corresponding impact on TELCO labor costs is +6.3% and the baseline value of 3% is derived using the Adjustment factors in Section II as

$$
\begin{aligned}
& 6.3 \times (3) \times (4) \times (5) \times (6) \times (8) \\
= \; & 6.3 \times .5850 \times .5438 \times .9287 \times 1.313 \times 1.3062 \\
= \; & \underline{3.18}
\end{aligned}
$$

There is thus an appropriate consistency in the baseline value used for this parameter. Nonetheless we will show the results of varying this value over a wide range (from 2% to 5%) while keeping the TELCO value constant at 6.3%.

Finally we will examine the sensitivity of our results to variations in the value used for labor supply elasticity. We believe, by setting the labor supply elasticity equal to zero rather than slightly negative, that already we have guarded against understating the impact on the GNP-PI. Nonetheless we will show the effect of using positive values of 0.1, 0.2, and 0.3 for the labor supply elasticity.

The table that follows shows the results obtained by changing each of the 6 baseline parameters, one at a time. In each of the rows of the table, the values of 5 of the 6 inputs to the model are the same as in the baseline calculation listed above. The input shown in the table is the one input that is changed from the baseline calculation.

Sensitivity Analysis

	Effect on GNP Price Index	Passthrough Coefficient
Price elasticity of demand = 3	0.0227%	0.041
Labor share in total cost, sector 1 = 0.50	0.0099%	0.021
Labor share in total cost, sector 1 = 0.78	0.0145%	0.023
Labor share in total cost, sector 2 = 0.50	0.0103%	0.020
Labor share in total cost, sector 2 = 0.78	0.0141%	0.024
Fraction of labor employed in sector 2 = 0.24	0.0104%	0.025
Fraction of labor employed in sector 2 = 0.40	0.0137%	0.020
Direct impact on labor costs in sector 2 = +2%	0.0056%	0.015
Direct impact on labor costs in sector 2 = +5%	0.0336%	0.037
Labor supply elasticity = 0.1	0.0642%	0.117
Labor supply elasticity = 0.2	0.1136%	0.205
Labor supply elasticity = 0.3	0.1579%	0.287

The Overall Results

We have concluded that the overall impact of SFAS 106 on the GNP-PI will reflect only 0.7% of the SFAS 106 costs incurred by TELCO. Separately we have calculated that if TELCO were able to benefit from the same relative reduction in its wage rate as will be experienced in the economy as a whole this would finance a further 14.5% of its additional SFAS 106 costs. This would leave 84.8% of TELCO's additional SFAS 106 costs to be met from other sources. We now show the sensitivity of the overall results to the interaction of the variability of the BLI Methodology and the variability of the inputs to the Macroeconomic Model.

The baseline inputs to the model include the assumption that the direct impact of SFAS 106 on labor costs in sector 2 is +3%. We have shown the effect on the model of reducing this figure to +2% or increasing it to +5% with other inputs remaining unchanged. The value of 3% (more precisely 3.18%) corresponds to a SFAS 106 Cost Increase Ratio of 28.3% (page 9). The values of 2% and 5% correspond to Cost Increase Ratios of 17.8% and 44.5% respectively: we believe this range adequately encompasses the likely variations in this ratio. To demonstrate the interactive effect of possible variability we have produced three sets of results, one for each of the values 2%, 3% and 5%. The following schedule shows for each of these values the results if each of the other inputs is set at the baseline values followed by the results if each of the other inputs is varied alone as indicated.

PERCENTAGE OF TELCO'S ADDITIONAL SFAS 106 COSTS:

(a) reflected in the GNP-PI,
(b) financed by potential reduction in relative wage rate and
(c) to be met from other sources

If Additional SFAS 106 cost of Average Employer With SFAS 106 Liabilities is

Input to Macroeconomic Model (All Baseline except as indicated)	2%			3%			5%		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Baseline	0.3	9.9	89.8	0.7	14.5	84.8	1.9	23.4	74.7
Price elasticity of demand = 3	0.6	9.6	89.8	1.3	14.1	84.6	3.4	22.3	74.3
Labor share in total cost, sector 1 = 0.50	0.2	9.5	90.3	0.6	13.9	85.5	1.5	22.6	75.9
Labor share in total cost, sector 1 = 0.78	0.4	11.4	88.2	0.8	16.8	82.4	2.2	27.2	70.6
Labor share in total cost, sector 2 = 0.50	0.3	10.4	89.3	0.6	15.5	83.9	1.6	25.0	73.4
Labor share in total cost, sector 2 = 0.78	0.4	8.6	91.0	0.8	12.8	86.4	2.1	20.6	77.3
Fraction of labor employed in sector 2 = 0.24	0.3	7.3	92.4	0.6	10.9	88.5	1.6	17.5	80.9
Fraction of labor employed in sector 2 = 0.40	0.3	12.4	87.3	0.8	18.2	81.0	2.1	29.4	68.5
Labor supply elasticity = 0.1	2.2	8.4	89.4	3.6	12.3	84.1	6.6	19.9	73.5
Labor supply elasticity = 0.2	4.0	7.1	88.9	6.2	10.4	83.4	11.0	16.6	72.4
Labor supply elasticity = 0.3	5.7	5.8	88.5	8.8	8.4	82.8	15.1	13.6	71.3

Other Factors

In performing this analysis there were two factors that simply could not be quantified due to lack of any relevant data. First of all as can be seen from Appendix A, our data base from which the GNP BLI was calculated included almost no employees working for employers with fewer than 500 employees. We believe that this tends to overstate the GNP BLI, because such limited data as exists suggests that the smaller the employer the less generous the benefits, but we cannot make a definitive statement to that effect. Secondly our analysis only incorporated the impact of SFAS 106 with respect to employer sponsored post-retirement medical plans. SFAS 106 also applies to Life and Dental plans as well as certain other miscellaneous benefits (e.g., subsidized telephone rates for retirees). As noted, there is simply no accessible data on the prevalence and magnitude of these plans in the GNP. We can, however, make two relevant observations:

- In general, post-retirement medical plans generate far greater SFAS 106 cost than post-retirement life, dental and other plans.

- If an employer does not sponsor a post-retirement medical plan it is almost certain that it does not provide any other post-retirement benefit coverage (other than pension).

Based on the above and the fact that only 26.8% of employees nationally will get post-retirement medical benefits subject to SFAS 106, we conclude that the inclusion of Life, Dental, and other non-pension benefits in the analysis had such data been available would not have had a material impact on the results.

Conclusion

Remembering that at each stage of our calculation process we have sought, when faced with a choice, to adopt a conservative stance and reviewing the results of this sensitivity analysis, we feel confident that our conclusions represent a reasonably accurate reflection of what is likely to happen in practice.

V. APPENDIX A - SUMMARY OF DATA

The tables, charts, and graphs on the following pages summarize the data utilized in this analysis. Included are the following:

- Summary of Godwins Company Data Base.
- Summary of BLI calculations.
- Comparison of TELCO and the GNP with respect to Demographic, Economic, and Actuarial factors.
- Summary of GAO findings on National Prevalence of Post-Retirement Medical Plans.

UNITED STATES TELEPHONE ASSOCIATION
POST-RETIREMENT HEALTH CARE STUDY
SUMMARY OF GODWINS DATA BASE

I. **Companies with Post-Retirement Medical Plan:**

Active Lives:	1 - 24		25 - 99		100 - 499		500 +		Total	
	# COS	# EES	# COS	# EES	# COS	# EES	# COS	# EES	# COS	# EES
Mining & Manuf.	0	0	2	135	13	5,095	431	11,124,456	446	11,129,686
Construction	0	0	0	0	0	0	6	94,893	6	94,893
Transportation	0	0	0	0	0	0	78	1,472,589	78	1,472,589
Retail	0	0	0	0	1	185	30	1,883,869	31	1,884,054
Finance/Insur.	0	0	2	115	13	4,078	207	3,545,526	222	3,549,719
Consumer Serv.	0	0	1	50	3	1,002	43	779,350	47	780,402
TOTAL	0	0	5	300	30	10,360	795	18,900,683	830	18,911,343

II. **Companies with No Post-Retirement Medical Plan:**

Active Lives:	1 - 24		25 - 99		100 - 499		500 +		Total	
	# COS	# EES	# COS	# EES	# COS	# EES	# COS	# EES	# COS	# EES
Mining & Manuf.	6	63	11	614	22	5,287	86	893,483	125	899,447
Construction	1	9	0	0	1	160	5	23,153	7	23,322
Transportation	1	19	0	0	5	1,065	13	77,332	19	78,416
Retail	0	0	0	0	3	760	15	453,510	18	454,270
Finance/Insur.	0	0	2	65	3	740	28	168,205	33	169,010
Consumer Serv.	3	36	1	30	6	1,395	29	484,552	39	486,013
TOTAL	11	127	14	709	40	9,407	176	2,100,235	241	2,110,478

UNITED STATES TELEPHONE ASSOCIATION

Post-Retirement Health Care Study
Summary of BLIs
Based on Godwins' Database

Average BLI Weighted by Number of Employees

Industry	Pre Age 65	Post Age 65	No. of Companies	No. of Employees
Agriculture, Mining, Manufacture & Wholesale Trade	0.7232	0.2340	446	11,129,686
Construction	0.7758	0.0604	6	94,893
Transportation & Utilities	0.7974	0.2643	78	1,472,589
Retail Trade	0.4730	0.0603	31	1,884,054
Finance & Insurance	0.6721	0.1926	222	3,549,719
Consumer Services	0.5771	0.1267	47	780,402
TOTAL	0.6887	0.2060	830	18,911,343

Company Size	Pre Age 65	Post Age 65	No. of Companies	No. of Employees
1-24 Employees			0	0
25-99 Employees	0.4850	0.1476	5	300
100-499 Employees	0.6482	0.1787	30	10,360
500+ Employees	0.6887	0.2060	795	18,900,683
TOTAL	0.6887	0.2060	830	18,911,343

UNITED STATES TELEPHONE ASSOCIATION

Post-Retirement Health Care Study
Comparison of TELCO Demographic and Economic Structures
and Actuarial Basis to National Averages

Demographic

	TELCO	Employers in GNP
Total Active Employees	613,193	114,400,000[1]
Active Employees covered by Retiree Medical Plans subject to SFAS 106	613,193	30,700,000[1]
Retirees covered by Medical Plans	294,482	5,300,000[1]
Average Age of Actives	41.6	38.2[2]
Average Service of Actives	16.6	8.5[3]

Economic

Compensation Per Employee	$38,533	$29,500[4]
Average Claim per Retiree	$3,075	$1,802[5]
Labor Cost as a % of Value Added	38.5%[6]	64.3%[4]
Value Added as a % of Output	74.3%[6]	100%
Accumulated VEBA assets	$1,258.8 million	N/A
Annual VEBA contributions in excess of claims	300.3 million	N/A

Actuarial

Pre-Retirement Turnover	T-2[7]	T-6[8]
Retirement Age	Table[7]	63[9]
1991 SFAS 106 expense	$2,693.1 million	N/A

1. Source - U.S. General Accounting Office
2. Source - U.S. Dept. of Labor, Bureau of Labor Statistics
3. Source - U.S. Bureau of the Census Current Population Reports
4. Source - U.S. Dept. of Commerce, Bureau of Economic Analysis Survey of Current Business
5. Source - 1990 Hewitt Associates Survey of Retiree Medical Benefits brought forward to 1991 with 19% trend
6. Source - 1990 ARMIS 43-02's for Price Cap LECs
7. See tables on page 48 for more detail
8. Source - Midpoint of Standard Tables used in generally accepted Actuarial Practice
   Source - The Gerontologist Vol. 28 No. 4

UNITED STATES TELEPHONE ASSOCIATION

Post-Retirement Health Care Study

TELCO Retirement Rates

Age	Rate of Retirement
55-61	9.54%
62	25.00%
63	10.00%
64	10.00%
65	67.00%
66-69	10.00%
70	100.00%

Comparison of TELCO Turnover Rates vs. "Standard" Rates

Probability of Remaining in Service Until Age 55

Table	T-1	TELCO T-2	GNP T-6	T-11
Current Age				
30	.743	.505	.250	.013
35	.873	.650	.363	.047
40	.958	.811	.510	.141
45	.995	.935	.687	.344
50	1.000	.992	.871	.664

Notes

1. Standard Tables in use range from T-1 (most conservative) through T-11 (least conservative). T-6 represents mid-point of range.
2. TELCO utilizes customized assumption most closely approximated by T-2.
3. Supporting evidence for low incidence of turnover at TELCO relative to national average can be seen by the higher average age and past service of TELCO employees relative to average age and service of national working population.

UNITED STATES TELEPHONE ASSOCIATION

Post-Retirement Health Care Study
Summary of Data on National Prevalence of
Post-Retirement Medical Benefit Plans
(Source = United States General Accounting Office)

Covered Employees* by Industry

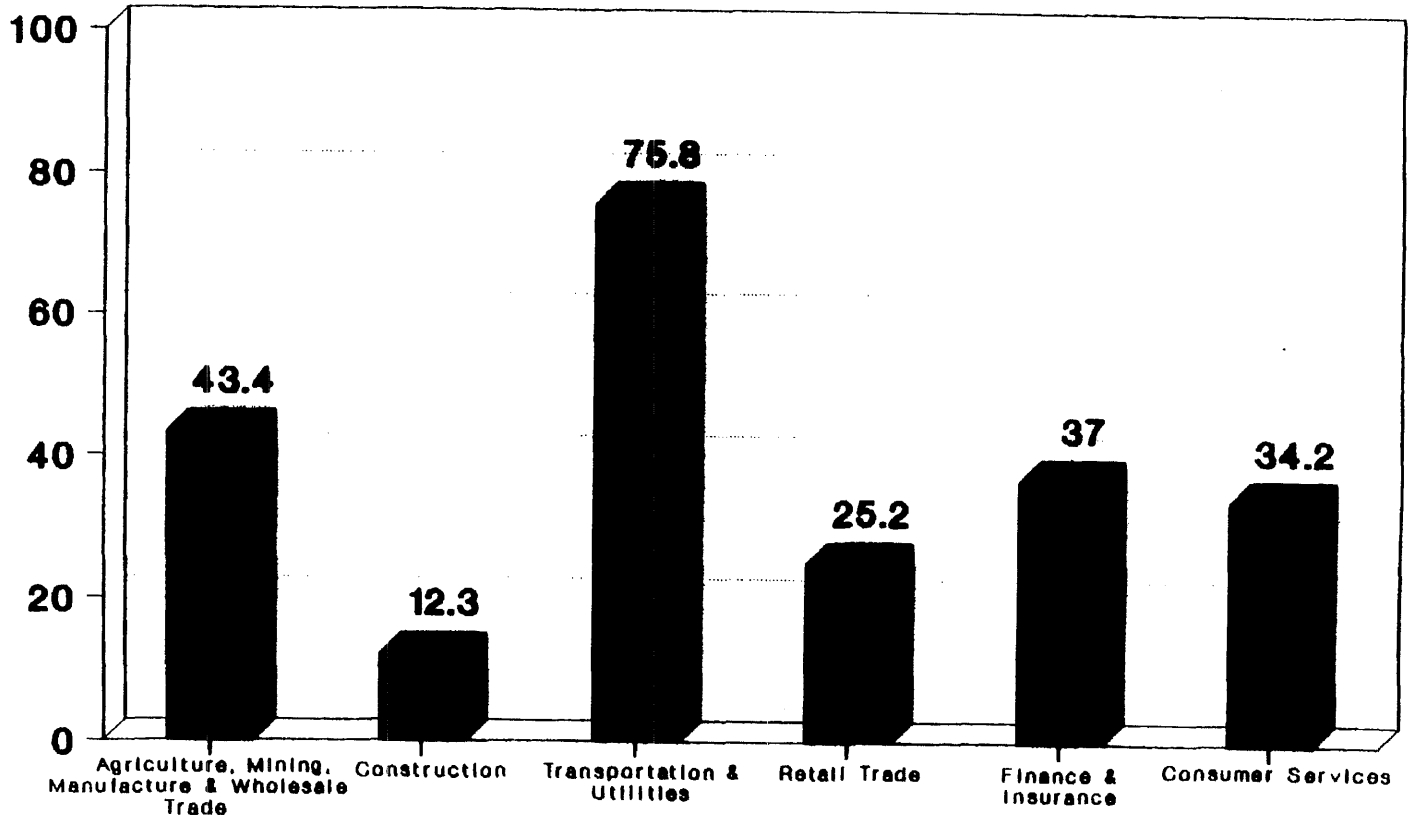
Industry	Total Employees	Covered Employees	% Total Employees Who Are Covered	% of Covered Employees in Industry
Agriculture, Mining, Manufacture & Wholesale Trade	26,729,660	11,602,872	43.4%	30.17%
Construction	4,592,367	562,891	12.3%	1.46%
Transportation & Utilities	11,674,827	8,853,209	75.8%	23.02%
Retail Trade	15,717,209	3,962,734	25.2%	10.31%
Finance & Insurance	28,210,193	10,431,800	37.0%	27.13%
Consumer Services	8,895,653	3,040,556	34.2%	7.91%
TOTAL	95,819,909	38,454,062	40.1%	100.00%

Covered Employees* by Company Size

Company Size	Total Employees	Covered Employees	% Total Employees Who Are Covered	% of Covered Employees by Company Size
1-24 Employees	13,384,195	556,209	4.2%	1.45%
25-99 Employees	12,713,231	1,663,938	13.1%	4.33%
100-499 Employees	19,631,184	3,847,903	19.6%	10.00%
500+ Employees	50,091,299	32,386,012	64.7%	84.22%
TOTAL	95,819,909	38,454,062	40.1%	100.00%

*Covered Employees means employees who work for companies which sponsor post-retirement medical plans. The GAO estimates that only 30.7 million of the 38.5 million covered employees actually could potentially qualify to receive coverage from company sponsored plans. The remaining 7.8 million employees represent those working for non-covered groups within the company (e.g. a subsidiary which does not participate in the company's plan) or employees who are covered by multi-employer plans which are not subject to SFAS 106.

United States Telephone Association
Post-Retirement Health Care Study
Summary of Data on National Prevalence of Post-Retirement Medical Benefit Plans

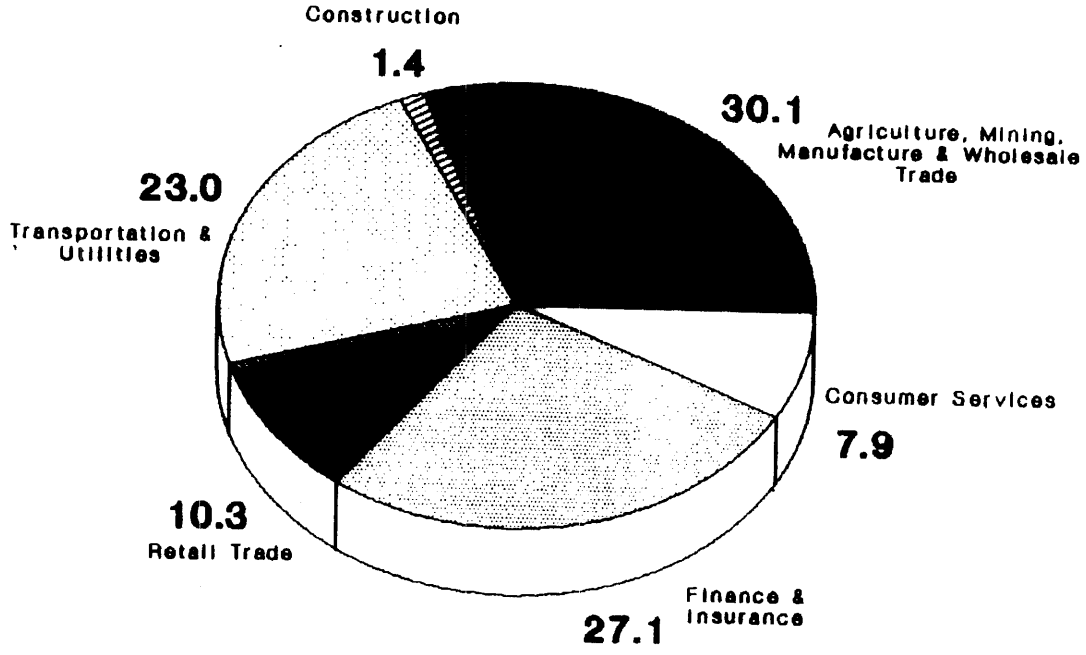


% Total EE's Who Are Covered by Industry

(Source = United States General Accounting Office)

Godwins

United States Telephone Association
Post-Retirement Health Care Study
Summary of Data on National Prevalence of Post-Retirement Medical Benefit Plans

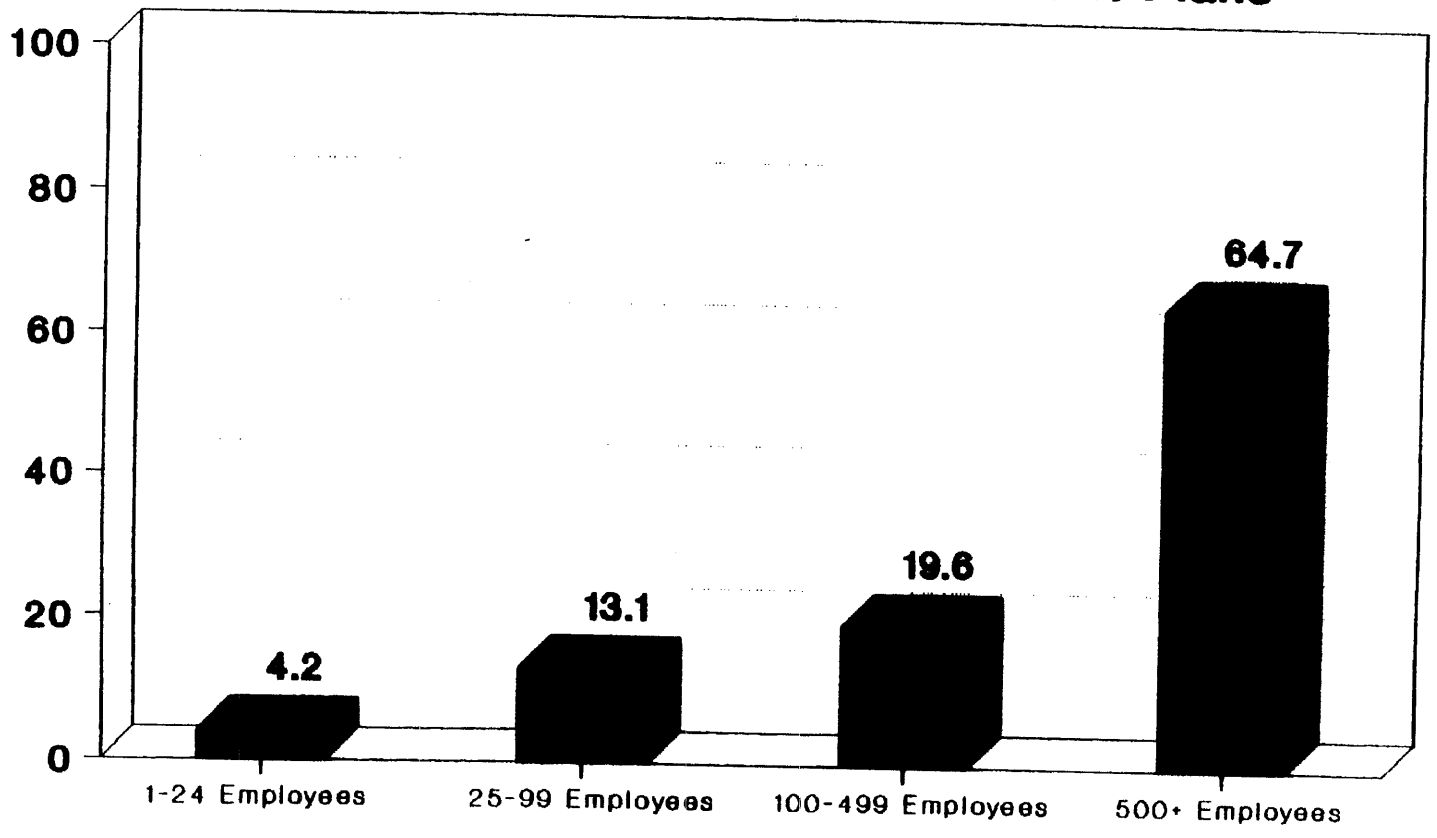


% of Covered Employees by Industry

(Source = United States General Accounting Office)

Godwins

United States Telephone Association
Post-Retirement Health Care Study
Summary of Data on National Prevalence of Post-Retirement Medical Benefit Plans

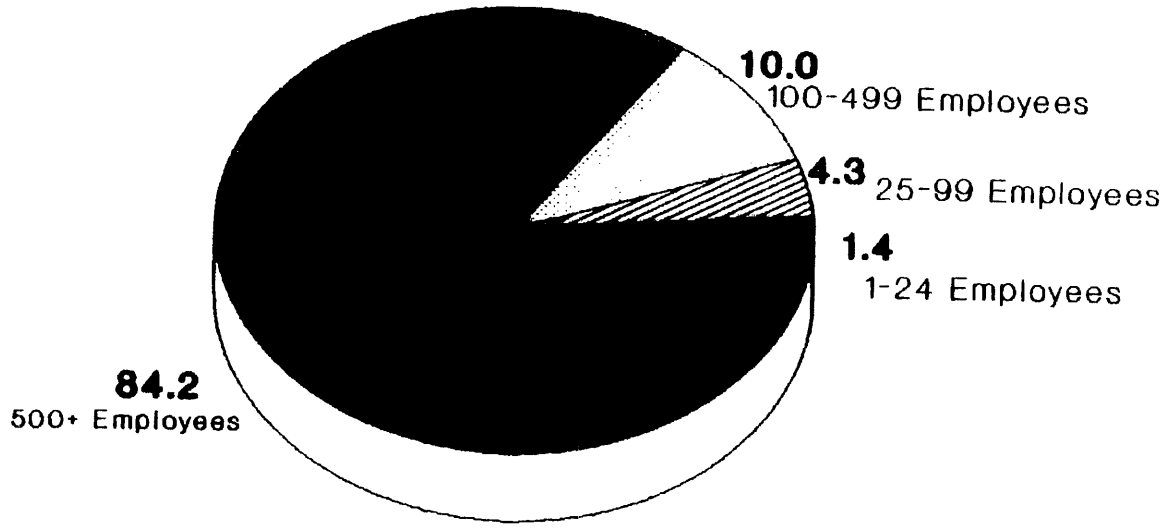


% Total EE's Covered by Company Size

(Source = United States General Accounting Office)

Godwins

United States Telephone Association
Post-Retirement Health Care Study
Summary of Data on National Prevalence of Post-Retirement Medical Benefit Plans



% of Covered Employees by Company Size

(Source = United States General Accounting Office)

Godwins

APPENDIX B - METHODS AND ASSUMPTIONS

Below is a description of the key methods and assumptions used for the derivation of the Demographic Adjustment as well as the basic BLI calculations. The methods and assumptions utilized in developing the other Adjustments are sufficiently documented in Section III.

Demographic Adjustment

The three adjustments making up the Demographic Adjustment were developed by calculating and comparing SFAS 106 costs for sample populations incorporating the GNP and TELCO demographic characteristics based on the age and service distribution of GNP and TELCO employees respectively. The calculations utilized pre- and post-65 per capita claim amounts that bear the same relationships to each other as do the pre- and post-65 BLIs for GNP and TELCO. All assumptions other than withdrawal, and retirement age (already discussed) were as follows:

discount rate - 8.13%
trend rate - 10.08% in 1991 decreasing gradually to 5.56% for the year 2006 and later
retirement eligibility - 55
amortization period for transition obligation - 20 years
percent married - 65%

BLI Calculations

The calculation of individual plan Benefit Level Indicators used the following data and methods.

A data base of annual claim amount distributions was used, based on the experience of 39,436 retirees who participate in employer sponsored post-retirement medical programs administered by a large national insurance company. For pre- and post-65 claimants, frequency weights, monetary weights, hospital/

drug/other ratios and Medicare reimbursements by type were developed. This data base has 35 claim ranges with average claim amounts in each range from $15 to $48,753.

The calculations also used our data base of the post-retirement medical plan provisions for 830 private sector employers. For both comprehensive and base plus plans the following data items were available;

- hospital room and board, either as days covered or a percentage
- surgical coverage
- in-patient physician coverage
- out-patient physician coverage
- diagnostic coverage
- prescription drug coverage, either percentage or flat dollar co-pay
- major medical deductibles
- major medical co-pay percentage
- out-of-pocket maximums
- annual/lifetime maximums
- Medicare integration method (i.e., carve-out, supplement or coordination of benefits)
- participant and dependent contribution rates

These provisions are available separately for pre- and post-65 claimants.

A particular plan's gross BLI was computed by determining how much the plan would reimburse at each claim amount in the distribution data base. The reimbursement amount was determined separately for each type of charge; e.g., hospital, drug, etc. Medicare reimbursement was taken into account explicitly for each type of charge based on the form of Medicare integration in the plan. Each reimbursement was then divided by the corresponding claim to obtain a reimbursement ratio. These ratios were then weighted by the claim amount weights in the distribution to determine the gross BLI.

Per retiree contribution rates were then compared to per retiree claim amounts, and that ratio was used as an offset to the gross BLI to determine the final net pre- and post-65 BLIs for each company in the data base.

After average pre- and post-65 BLIs had been determined for GNP and TELCO (see Section III page 11 for methodology), pre- and post-65 weightings were calculated as the percentages of total SFAS 106 cost associated with pre- and post-65 claims, determined using the same methodology as for the Demographic Adjustment. These were then applied to the pre- and post-65 BLIs to develop GNP BLI and TELCO BLI.

By way of illustration, suppose a comprehensive plan pays 80% after a $200 deductible, subject to an out-of-pocket maximum of $1,500. After 65, Medicare integration is 'Supplement'. Participants contribute $10 per month.

In the $4,000 - $5,000 claim range, for example, we find the average claim to be $4,479. Since this is a comprehensive plan, we derive the pre-65 reimbursement utilizing the total claim amount, that is (4,479 - 200) times 80%, or $3,423. The out-of-pocket maximum has not been met. Therefore, the pre-65 reimbursement ratio in the charge range is 0.7642. The ratios for all ranges are averaged using weights given by the distribution table to determine the gross pre-65 BLI.

The post-65 reimbursement recognizes Medicare integration, in this example the method is Medicare Supplement. We determine the breakdown of charges to be $1,776 for hospital, $567 for prescription drugs, and $2,136 for all other charges. Total Medicare reimbursement is $2,047 (calculated explicitly from

Medicare provisions) and is immediately taken out; in this case $1,177 from hospital, $870 from other medical charges and nothing from drug charges. The plan provisions are then applied to the balance of $2,432, giving a plan reimbursement of $1,786 ((2,432 - 200) times 80%). This produces a post-65 reimbursement ratio of 0.3987 for this claim range. As with the pre-65 case the ratios for all ranges are then averaged using weights given by the distribution table to determine the gross post-65 BLI.

The gross BLIs are then adjusted to reflect participant contributions. Our example here might produce gross BLIs of 0.85 pre-65 and 0.32 post-65. The participant contribution of $10 per month translates into a reduction in the gross BLIs of 0.03 pre-65 and 0.04 post-65, giving final BLIs of 0.82 and 0.28 respectively.

NYASZ #157

Appendix C

Part I: Derivation of the Model

I. Households

All households are assumed to be identical and obtain utility from money and leisure as well as each of the m produced goods. Each household solves the following maximization problem

$$(A1)\quad U^* = \max_{(C_i,M,N)} \left(C^{\gamma}(M/P)^{1-\gamma} - (\phi N^{\eta+1})^{1/\eta}\right)$$

subject to the constraint that

$$(A2)\quad M + \Sigma_i P_i C_i = I$$

where

$$(A3)\quad C = (\Sigma_i \alpha_i C_i^{(\theta-1)/\theta})^{\theta/(\theta-1)}$$

$$(A4)\quad P = (\Sigma_i \alpha_i^{\theta} P_i^{1-\theta})^{1/(1-\theta)}$$

and C_i is the consumption of produced good i, P_i is the nominal price of produced good i, M is the amount of money held at the end of the period, N is the amount of labor supplied, I is the total nominal value of resources available to the household, C is the bundle of consumption goods defined by the aggregator function in (A3), and P is a price index defined in (A4). (Note that the price index P in (A4) is not the fixed-weight GNP price index. The solution of the model produces prices for each of the m goods which can then be combined to calculate the appropriate fixed-weight GNP price index.) The parameters of the utility function are γ, which equals the share of the household's nominal expenditure on produced goods rather than on money balances; θ, which is the elasticity of substitution between the consumption of any pair of goods; α_i, i = 1,...,m, which indicate the weight of each good in the household's utility function; η, which is the elasticity of labor supply; and ϕ which characterizes the degree of disutility of labor.

The utility function in equation (A1) is additively separable between (C_i,M) and N. This separability allows us to solve the household's maximization problem in two stages. First, we will maximize utility with respect to C_i and M, and then we will choose the utility-maximizing level of labor supply N. Choosing C_i and M to maximize the utility function in (A1) subject to the constraint in (A2) yields the following first-order conditions:

$$(A5)\quad \alpha_i C_i^{-1/\theta} \gamma C^{\gamma-1+1/\theta}(M/P)^{1-\gamma} = \mu P_i$$

$$(A6)\quad (1-\gamma)C^{\gamma}(M/P)^{-\gamma}/P = \mu$$

where μ is the Lagrange multiplier on the constraint (A2).

Combining the first-order conditions (A5) and (A6) yields

(A7) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} M = (1-\gamma) P_i$

Multiplying both sides of (A7) by C_i and then summing over all i yields

(A8) $\Sigma_i P_i C_i = (\gamma/(1-\gamma))\ M$

Substituting (A8) into (A2) yields

(A9) $M = (1-\gamma)I$

Substituting (A9) into (A7), summing over all i, and using the definition of the price index in (A4) yields

(A10) $PC = \gamma I$

Substituting (A9) into (A7) and then using (A10) yields the demand for good i

(A11) $C_i = \alpha_i^{\theta} (P_i/P)^{-\theta} \gamma I/P$

Substituting (A9) into (A11) yields

(A12) $C_i = \alpha_i^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma))M/P$

Having solved for the optimal values of C_i and M, we now solve for the optimal value of labor supply N. First, substitute the optimal values of C_i (eq. A11) and M (eq. A9) into the utility function in (A1) to obtain

(A13) $U^* = \max_N \{\gamma^{\gamma}(1-\gamma)^{1-\gamma}(I/P) - (\phi N^{\eta+1})^{1/\eta}\}$

subject to $I = wN + rK^* + M + \pi$, where π is the (present value of) post-retirement health benefits to be received by the household.

The first-order condition for labor supply N is

(A14) $\gamma^{\gamma}(1-\gamma)^{1-\gamma}(w/P) = ((\eta+1)/\eta)(\phi N)^{1/\eta}$

which can be solved to obtain N*, the optimal amount of labor supplied

(A15) $N^* = \nu(w/P)^{\eta}$

where $\nu = [\gamma^{\gamma}(1-\gamma)^{1-\gamma}\eta/(\eta+1)]^{\eta}\phi^{-1}$

II. Firms

Each of the m goods is produced by competitive firms with Cobb-Douglas production functions. The total production of good i, Y_i, is given by the production function

(A16) $Y_i = A_i N_i^{\rho_i} K_i^{1-\rho_i}$ $\quad i = 1,\ldots,m$

The firms are assumed to be competitive and thus take the nominal price of their output, P_i, the nominal rental price of capital, r, and the nominal price of labor, $D_i w$, as fixed. Note that the nominal price of labor consists of two parts: w reflects the nominal wage rate excluding the cost of post-retirement health benefits covered by FAS 106. The factor D_i reflects the impact on the cost per unit of labor of post-retirement health benefits covered by FAS 106. For firms that do not offer post-retirement health benefits, $D_i = 1$. For firms that offer such benefits, $D_i > 1$. Competitive firms choose N_i and K_i to maximize

(A17) $P_i A_i N_i^{\rho_i} K_i^{1-\rho_i} - wD_i N_i - rK_i$ $\quad i = 1,\ldots,m$

The first-order conditions for labor and capital are

(A18) $\rho_i P_i Y_i / N_i = wD_i$ $\quad i = 1,\ldots,m$

(A19) $(1-\rho_i) P_i Y_i / K_i = r$ $\quad i = 1,\ldots,m$

Given the nominal wage w and the FAS 106 factor D_i, (A18) determines the amount of labor demanded in sector i; given the rental price of capital, (A19) determines the amount of capital demanded in sector i.

III. Market Equilibrium

Equilibrium in the factor markets requires that the aggregate amount of labor demanded equal the supply of labor and the aggregate amount of capital demanded equal the supply of capital:

(A20) $\Sigma_i N_i = N^*$

(A21) $\Sigma_i K_i = K^*$

The amount of money demanded equals the amount initially held by consumers

(A22) $M = M^*$

The amount of good i produced must equal the amount of good i demanded, so that using (A12) we obtain

(A23) $Y_i = \alpha_i^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma)) M/P$

The nominal value of production must equal the nominal value of total factor payments, including the (present value of the) cost of post-retirement health benefits,

(A24) $\Sigma_i P_i Y_i = rK^* + w\Sigma_i D_i N_i$

The nominal value of total resources available to the household, I, equals the initial holding of money M^* plus capital income rK^*, wage income, $w\Sigma_i N_i$, and the present value of post retirement health benefits $\pi = w\Sigma_i (D_i - \bar{I}) N_i$ so that

(A25) $I = M^* + rK^* + w\Sigma_i D_i N_i$

The solution to the model consists of the equilibrium conditions (A20) - (A25), the production functions (A16), the labor demand equations (A18), the capital demand equations (A19), and the definition of the price index (A4).

Part II: Calibration of the model

The model is calibrated so that in the absence of FAS 106 it yields an allocation of labor across sectors that matches the actual allocation of labor across sectors. It is also calibrated such that in the absence of FAS 106, all nominal prices are equal to one.

Inputs to the calibration procedure:

η, the elasticity of labor supply

θ, the elasticity of substitution between the consumption of any two goods

γ, the share of nominal expenditure devoted to produced goods

N_o^*, the initial total amount of labor to be allocated across sectors

K^*, the fixed total amount of capital to be allocated across sectors

ρ_i, the share of labor in total cost in sector i

D_i, the FAS 106 cost factor in sector i (equal to 1 in the absence of FAS 106)

$s^N_i = N_i/N^*$, the fraction of labor employed in sector i

In the initial calibration, all nominal prices are set equal to one

(B1) $P_i = 1, \qquad i = 1,\ldots,m$

(B2) $P = 1$

The amount of labor initially used in each sector follows directly from the fraction of the labor force employed in sector i, s^N_i, and the total amount of labor employed, N_o^*

(B3) $N_i = s^N_i \, N_o^* \qquad i = 1,\ldots,m$

Define $s^Y_i = P_iY_i/\Sigma_iP_iY_i$ to be the share of sector i's output P_iY_i in total output $\Sigma_iP_iY_i$. Then using the labor demand equation (A18) and the fact that the total amount of labor employed is N_o^*, it can be shown that

(B4) $s^Y_i = (D_is^N_i/\rho_i)/\Sigma_i(D_is^N_i/\rho_i) \qquad i = 1,\ldots,m$

Using the capital demand equation (A19) and the fact that the total amount of capital used is K^*, it can be shown that

(B5) $K_i = [(1-\rho_i)s^Y_i/\Sigma_i(1-\rho_i)s^Y_i] \, K^* \qquad i = 1,\ldots,m$

Normalize $A_1 = 1$ so that the production function in the first sector is

(B6) $Y_1 = N_1^{\rho_1} K_1^{1-\rho_1}$

Using Y_1 from (B6), the nominal wage and the nominal rental price of capital can be determined from the first-order conditions (A18) and (A19) for sector 1 to obtain

(B7) $w = \rho_1 Y_1 P_1/(D_1 N_1)$

(B8) $r = (1-\rho_1) Y_1 P_1/K_1$

Now calculate ν in the labor supply curve (eq. A15) as

(B9) $\nu = N_o^* (P/w)^{\eta}$

To calibrate A_i, $i = 2,\ldots,m$, substitute the production function (A16) into the first-order condition for labor (A18) and set $P_i = 1$ (eq. B1) to obtain

(B10) $A_i = (D_i w/\rho_i)(N_i/K_i)^{1-\rho_i}$ $\qquad i = 2,\ldots,m$

Now set all prices equal to 1 in the equilibrium condition (A23), and use (A22) to obtain

(B11) $Y_i = \alpha_i^{\theta}(\gamma/(1-\gamma))M^*$

Summing (B11) over all i we obtain

(B12) $\Sigma_i Y_i = (\gamma/(1-\gamma))M^* \Sigma_i \alpha_i^{\theta}$

Now observe that with $P = P_i = 1$ for all i, equation (A4) implies that

(B13) $\Sigma_i \alpha_i^{\theta} = 1$

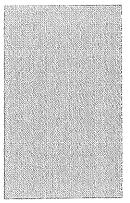
Substituting (B13) into (B12) and rearranging yields

(B14) $M^* = ((1-\gamma)/\gamma)\ \Sigma_i Y_i$

Finally, substituting (B14) into (B11) and recalling that when $P_i = P = 1$, $s^Y_i = Y_i/\Sigma Y_i$, we obtain

(B15) $\alpha_i^{\theta} = s^Y_i$ $\qquad i = 1,\ldots,m.$

Attachment D - 1992 Explanation of Macroeconomic Model



Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	
Treatment of Local Exchange Carrier Tariffs Implementing Statement of Financial Accounting Standards, "Employers Accounting for Postretirement Benefits Other Than Pensions"	)	CC Docket No. 92-101
Bell Atlantic Tariff F.C.C. No. 1	)	Transmittal No. 707
U S West Communications, Inc. Tariff F.C.C. Nos. 1 and 4	)	Transmittal No. 246
Pacific Bell Tariff F.C.C. No. 128	)	Transmittal No. 1579

DIRECT CASE
OF THE
UNITED STATES TELEPHONE ASSOCIATION

I. INTRODUCTION.

The United States Telephone Association (USTA) respectfully submits its direct case in the above-referenced proceeding. USTA is the principal trade association of the exchange carrier industry. Its membership of approximately 1100 local telephone companies includes the carriers listed in the caption, which have filed tariffs to increase their price cap index levels as a result of their implementation of the Statement of Financial Accounting Standards - 106, (SFAS-106), "Employers Accounting for Postretirement Benefits Other Than Pensions," (OPEB). USTA also represents all of the other price cap exchange carriers and the majority of small and mid-sized non-price cap carriers who may elect price cap regulation in the future. Thus, a significant

number of exchange carriers could be affected by Common Carrier Bureau (Bureau) action in this docket.

In the three tariff transmittals before the Commission, Bell Atlantic, U S West and Pacific Bell state that the incremental costs of implementing SFAS-106 should be reflected as exogenous cost changes since these costs meet the requirements for exogenous treatment and are not reflected in the price cap formula. USTA commissioned the study undertaken by Godwins, "Post-Retirement Health Care Study Comparison of TELCO Demographic and Economic Structures and Actuarial Basis National Averages" (1992) submitted by Bell Atlantic and U S West as support for their transmittals. The study may also be relied upon by other exchange carriers in their direct cases.

II. RESPONSE TO PARAGRAPH 16 OF THE ORDER INVESTIGATION AND SUSPENSION.

In paragraph 16 the Bureau requests information to evaluate a macroeconomic model and its results. Attached hereto is a point-by-point response to the issues raised in that paragraph as well as a discussion of the type of model used by Godwins.

The macroeconomic model used in the Godwins report is a classical general equilibrium model. It meets all of the necessary characteristics for a model. It also provides a conservative approach by calculating the impact on the macroeconomy after the economy fully responds to SFAS-106. This

helps to guard against understating the impact of SFAS-106 on GNP-PI.

In addressing the issues raised in paragraph 16, the attachment describes the calibration procedures used to match the numerical results produced by the model with U.S. data. It is important to note that the model is specifically designed not to be a forecasting model, but instead to directly focus on how much different GNP-PI is as a result of the introduction of SFAS-106.

III. CONCLUSION.

The OPEB costs at issue here are exogenous. The change in the accounting for these costs is outside the control of exchange carriers. The Financial Accounting Standards Board requires mandatory adoption of SFAS-106 and the Commission has also required mandatory adoption of SFAS-106.[1] Using the results of the Godwins study the impact of implementing SFAS-106 will not be double-counted within the context of the price cap formula. The Godwins study identifies and allows for the elimination of the impact SFAS-106 will have on GNP-PI. In fact, the Commission has stated that SFAS-106 would, presumably, be an exogenous cost for

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[1] In the Matter of Southwestern Bell, GTE Service Corporation, Notification of Intent to Adopt Statement of Financial Accounting Standards No. 106, Employers' Accounting for Postretirement Benefits Other Than Pensions, AAD 91-80, Order, FCC 91-1582, released December 26, 1991.

price cap purposes.[2]

Based on the foregoing, USTA urges the Bureau to recognize OPEB costs as exogenous for price cap purposes.

Respectfully submitted,

UNITED STATES TELEPHONE ASSOCIATION

By Linda Kent

Martin T. McCue
General Counsel

Linda Kent
Associate General Counsel

900 19th Street, NW, Suite 800
Washington, D.C. 20006-2105
(202) 835-3100

June 1, 1992

Attachment

[2] In the Matter of American Telephone and Telegraph Company Revisions to Tariff F.C.C. Nos. 1, 2 and 13, Memorandum Opinion and Order, released June 27, 1990 at paragraph 4.

Response to Paragraph 16

of FCC Order of Investigation and Suspension

CC Docket No. 92 - 101

May 26, 1992

Godwins

Paragraph 16 requests information that can be used in a serious impartial evaluation of a macroeconomic model and its results. Ideally, enough information should be provided so that the numerical results produced by a macroeconomic model can be reproduced, or at least checked, by an outside reader with a professional training in economics. In writing the macroeconomic portions of the Godwins report we tried to anticipate the need for reproducibility and included in the report enough information to reproduce the numerical results of the macroeconomic model (See Appendix C of the Godwins report). However, the explanation in Appendix C of the Godwins report is relatively brief, so we will use the opportunity presented by Paragraph 16 to elaborate on various aspects of the macroeconomic model and its calibration.

Before presenting a detailed point-by-point response to items raised in Paragraph 16, it might be helpful to discuss the type of macroeconomic model used in the Godwins report and to contrast this model with conventional large-scale short-run econometric forecasting models. The reason for contrasting the two types of models is that the requests in Paragraph 16 constitute an appropriate set of questions for scrutinizing the results of a conventional large-scale econometric forecasting model. However, some of the questions are not germane for scrutinizing the macroeconomic model used in the Godwins report.

The macroeconomic model used in the Godwins report is a classical general equilibrium model. As discussed in the Godwins report on pp. 26-27, the choice of a type of macroeconomic model for examining the effect on GNP-PI of the introduction of SFAS 106 was guided by a list of five desirable characteristics for a model:

(1) The model should be a multi-sector model allowing for some firms to offer post-retirement health benefits while other firms do not offer such benefits.

(2) The model should explain how production costs are related to the costs of labor and other inputs, and should allow for the possibility of substituting capital for labor as labor becomes more expensive.

(3) The model should provide a specification of the demand for goods related to the overall price level as well as to prices of goods in each sector.

(4) The model should be tractable so that numerical solutions can be computed and readily interpreted.

(5) The model should be internally consistent and based on sound economic foundations.

The classical general equilibrium model used in the Godwins report meets all five of these criteria. However, large-scale commercial econometric models do not meet all of these criteria. In particular, most large-scale commercial econometric models do not meet criteria (4)

and (5). These models typically contain several hundred, or even over a thousand, equations and variables to be forecast. In addition to the sheer difficulty of tracing the effects of so many variables, the forecasts produced by commercial forecasters generally are based also on other factors such as time-series analysis, current data analysis, and "judgment". The fact that the forecasts of these models are based significantly on judgment and current data analysis makes it very difficult for an impartial observer to reproduce the results of these models and obscures the ability to readily interpret the forecasts produced by these commercial forecasters. Commercial large-scale econometric models in general have also been criticized for failure to satisfy criterion (5) that they be internally consistent and based on sound economic foundations. In light of the five desirable characteristics listed above, it was decided that a classical general equilibrium model would be preferable to a large-scale commercial econometric model for the purpose of evaluating the effect on GNP-PI of the introduction of SFAS 106.

An additional consideration that led to the choice of the classical general equilibrium model is related to the timing of the responses to the introduction of SFAS 106. The classical general equilibrium model is intended to gauge the effects of changes after the economy has returned to equilibrium, which may take several calendar quarters or years. This model does not address the extremely difficult task of predicting the dynamic responses over the short-run. By contrast, large-scale econometric models deliver a series of quarterly forecasts of GNP and other macroeconomic variables. However, in our judgment, short-run dynamic behavior is extremely difficult to forecast. Although these models do produce short-run forecasts, we would be cautious in interpreting the timing implied by these short-run forecasts. We decided to sidestep this difficult problem by using the conservative approach of calculating the impact on the macroeconomy after the economy fully responds to SFAS 106. The sense in which this approach is conservative is that it probably will overstate the short-run impact on macroeconomic variables, and thus helps guard against understating the impact on GNP-PI.

Now we will present a detailed point-by-point response to the issues raised in paragraph 16. We will structure the responses according to the following list of requests in Paragraph 16:

(1) fully describe and document the macroeconomic model, including

- (a) the method of estimation
- (b) parameter estimates
- (c) summary statistics

(2) provide the same information as in (1) for any alternate functional forms that were used

(3) provide the data used to estimate the model

(4) provide the data used in making forecasts from the model

(5) provide the results of any sensitivity analyses performed to determine the effect of using different assumptions.

Response to request (1): fully describe and document the macroeconomic model, including the method of estimation, parameter estimates, and summary statistics.

The macroeconomic model used in the Godwins report is described verbally on pp. 27-28 of the Godwins report, and a complete mathematical derivation and description of the model is presented in Part I of Appendix C, pp. 54-57. In order to apply this mathematical model to the United States, numerical values of the parameters need to be selected. In a conventional large-scale commercial econometric model, the numerical values of the parameters are typically estimated econometrically. For these models, it is important to ask about the method of estimation, the parameter estimates, and summary statistics describing the statistical properties of the parameter estimates and the model forecasts. However, the values of the parameters used in the classical general equilibrium model in the Godwins report were not econometrically estimated in the course of the preparation of the Godwins report. Instead, the numerical values of the model were calibrated so that in the baseline calculation without SFAS 106, the numerical results produced by the model matched U.S. macroeconomic data.

The calibration procedure is described in Part II of Appendix C, pp. 58-59, but here we will present a verbal description of the calibration. The utility function of households contains the following parameters:

α_1 and α_2, which measure the relative desirability to consumers of the goods produced in sectors 1 and 2: The larger is α_1 relative to α_2, the larger is the production of good 1 relative to good 2, and the larger is the share of the labor force employed in sector 1. The values of α_1 and α_2 are chosen so that in the initial equilibrium (before the introduction of SFAS 106) 68% of the labor force is employed in sector 1 (which does not offer SFAS 106 benefits) and 32% of the labor force is employed in sector 2 (which offers SFAS 106 benefits). These figures for the shares of employment in sector 1 and in sector 2 match U.S. data as indicated on page 7 of the Godwins report. (Of the 95.8 million private sector employees, 30.7 million are eligible to have a proportion of their charges in retirement met by their employer's medical plan. Thus, the share of the private sector labor force employed in sector 2 is 30.7 million/95.6 million = 32%.)

θ, which is the elasticity of substitution between the consumption of any two goods: The parameter θ equals the price of elasticity of the demand for goods. This parameter was not estimated nor was

it directly calibrated to data. As stated on page 29 of the Godwins report, a value of 1.5 was used for θ, recognizing that this value most likely overstates the true price elasticity of demand. Experimentation with the value of θ indicated that the impact of SFAS 106 on the GNP-PI increases when the price elasticity of demand increases. (See the table on page 41 of the sensitivity analysis in the Godwins report.) Thus, using a high value of θ would guard against understating the impact of SFAS 106 on the GNP-PI.

η, which is the elasticity of labor supply: The elasticity of labor supply has been estimated econometrically in dozens of studies. Rather than try to estimate this elasticity again for the Godwins study, we referred to surveys of econometric studies of labor supply. The first complete paragraph on page 30 of the Godwins report describes the results of these studies and explains the choice of the value of zero for the labor supply elasticity.

We can amplify the discussion on page 30 by pointing out that there is an important difference between the response of labor supply to a *temporary* change in the real wage and a *permanent* change in the real wage. Economists explain the difference by using the concepts of an income effect and a substitution effect. An increase in the real wage increases the reward for working and causes people to substitute some of their time away from leisure toward working. Thus, the substitution effect of an increase in the real wage is an increase in labor supply. In addition, an increase in the real wage makes workers wealthier and reduces the need to work (or equivalently makes workers able to afford more leisure and less labor). This effect, known as the income effect, means that workers will reduce their labor supply in response to an increase in the real wage. Thus, the income effect and the substitution effect work in opposite directions: the substitution effect increases labor supply and the income effect reduces labor supply when the real wage increases. For a temporary increase in the real wage, the worker does not become very much wealthier and the income effect is relatively small. The income effect is likely to be smaller than the substitution effect and thus workers would be likely to increase labor supply in response to a temporary increase in the real wage. In contrast, for a permanent increase in the real wage, the income effect is likely to be relatively large. If the income effect is larger than the substitution effect, then workers will reduce their labor supply in response to a permanent increase in the real wage, which is a negative labor supply elasticity.

The introduction of SFAS 106 is a permanent change and thus any effects on the real wage are to be regarded as permanent effects rather than temporary effects. Thus, in choosing a value of the labor supply elasticity, it is appropriate to use the elasticity describing the response to a permanent change in the real wage. The econometric estimates described on page 30 of the Godwins

report refer to permanent wage changes, and the use of income and substitution effects explains why these estimated elasticities are somewhat negative. The impact of SFAS 106 on the GNP-PI is larger for higher labor supply elasticities, and the labor supply elasticity was set to zero in the baseline calculation to guard against understating the impact on the GNP-PI.

γ, which is the share of nominal expenditure devoted to produced goods: Given the calibration of the other parameters of the model, the value of γ does not affect the calculated effects of SFAS 106 on GNP-PI or the wage rate. As explained in Part II of Appendix C of the Godwins report, the model is calibrated so that in the absence of SFAS 106, prices in all sectors and the GNP-PI are normalized to equal 1.0. With this normalization, the value of γ becomes completely irrelevant to the numerical results of the model.

ϕ, which measures the disutility of labor: With the specification of the utility function in equation (A1) in Appendix C of the Godwins report, the labor supply curve has a constant elasticity with respect to the real wage. With a constant elasticity with respect to the real wage, the labor supply curve depends on only two parameters: the elasticity of labor supply and a location parameter. The elasticity of labor supply has already been discussed. The location parameter was chosen to make labor supply equal to labor demand as indicated in equation (B9) in Part II of Appendix C in the Godwins report. Given the labor supply elasticity and the location parameter, the numerical value of the parameter ϕ is irrelevant.

The production function contains the following parameters:

ρ_1 and ρ_2, which are the shares of labor cost in value added in sectors 1 and 2 respectively: In the baseline calculations, each of these parameters is set equal to 0.64 which is the share of labor cost in value added for the U.S. economy as a whole.

A_1 and A_2, which are productivity parameters in sectors 1 and 2 respectively: These parameters affect the demand for labor in each sector. They are calibrated so that when labor supply equals labor demand, 68% of the labor force is employed in sector 1 and 32% of the labor force is employed in sector 2. The details of this calibration are contained in Part II of Appendix C, pp. 58-59.

Response to request (2): provide the same information as in (1) for any alternate functional forms that were used.

Experimentation with different functional forms and different parameter values involves a fundamental tension. On the one hand,

experimentation with different functional forms and different parameter values offers the benefit of learning how robust the results are to various changes in the model. On the other hand, experimentation may allow the researcher to go on a "fishing expedition", fishing for the functional forms and parameter values that deliver the most pleasing result. We tried to strike the appropriate balance by not experimenting with functional forms (except as described below) and by reporting the results of experimentation with parameter values in the sensitivity analysis.

The only change in the model that might be construed as a change in functional form occurred while the model was in a developmental stage before Godwins was engaged by USTA. In the developmental stage, the original (simpler) functional form for labor supply assumed that the labor supply elasticity must be zero. However, we modified the labor supply function to its current form to allow the labor supply elasticity to be either zero or nonzero. In a sense, this change was not really a change in functional form because the original labor supply function is a special case of the labor supply function used in the Godwins report. The baseline calculations use a value of zero for the labor supply elasticity, but we decided to allow for nonzero labor supply elasticities so that we could perform a sensitivity analysis on the labor supply elasticity. The results of the sensitivity analysis are reported in section IV of the Godwins report.

The functional form used for the production functions is the Cobb-Douglas production function. This functional form is perhaps the most widely used functional form for production functions.

The functional form of the utility function was chosen so that the elasticity of labor supply and the price elasticity of demand for each good are all constant. Various constant values of these elasticities were used in the sensitivity analysis. The functional form of the utility function was also chosen to incorporate the effects on demand of the aggregate price level as well as the individual sector prices.

Response to request (3): provide the data used to estimate the model.

As explained above, the model used in the Godwins report is not an econometric model. The choice of values for various parameters was described in response to request (1).

Response to request (4): provide the data used in making forecasts from the model.

Conventional large-scale commercial econometric models are frequently used to make short-run macroeconomic forecasts of a variety of macroeconomic variables. The forecasts are *conditional* forecasts which means that the forecasts depend on the assumed future values of various input variables to the model. For such models, it is important to examine the data used in making forecasts from the model as well as

summary statistics describing historical forecast accuracy (which is related to request (1c) above).

The macroeconomic model in the Godwins report is not a conventional short-run forecasting model. The only additional data that is used to calculate the macroeconomic effects of the introduction of SFAS 106 is the direct percentage increase in labor costs for firms in sector 2. In the baseline calculations a value of 3% is used for the direct percentage increase in labor costs for firms in sector 2. In the sensitivity analysis values of 2% and 5% are also used.

Summary statistics are often used to gauge the forecasting accuracy of conventional short-run econometric forecasting models, but such statistics are not appropriate in the case of the macroeconomic model used in the Godwins report. Short-run econometric forecasting models produce forecasts of a variety of economic variables and, after the fact, the accuracy or forecast error of each forecast can be evaluated. For instance, a model could be used in 1992 to forecast GNP-PI in 1993. Then after we learn what the actual value of GNP-PI turns out to be in 1993, we can calculate the forecast error as the difference between the forecasted value of GNP-PI and the actual value of GNP-PI. Then after several years, the accuracy of the forecasts can be gauged by appropriate summary statistics of the forecast errors.

The model in the Godwins report is not a forecasting model in the same sense as the large-scale commercial econometric models. The model is not designed to forecast the actual level of GNP-PI. Instead it is designed to estimate the *change* in the level of GNP-PI that results from the introduction of SFAS 106. That is, the model is designed to calculate the difference between the actual value of GNP-PI after the introduction of SFAS 106 and the value of GNP-PI that *would have prevailed* if SFAS 106 were not introduced. Even after the fact, when we observe the actual value of GNP-PI in the presence of SFAS 106, we will not be able to assess the accuracy of the model in the standard way. Remember that the model produces an estimate of how much different GNP-PI is as a result of the introduction of SFAS 106. To assess the accuracy of this estimate we would need to know the actual level of GNP-PI after the introduction of SFAS 106 and we would also need to know the value that GNP-PI would have had if SFAS 106 were not introduced. Even after the fact, we cannot observe or directly measure the level that GNP-PI would have taken in the absence of SFAS 106. Thus traditional measures of forecast accuracy cannot be used to assess the accuracy of the model in the Godwins report.

Three additional remarks are in order at this point. First, the model is specifically designed not to be a forecasting model but instead to focus on how much different GNP-PI is as a result of the introduction of SFAS 106. This focus is exactly the question at issue in the Godwins report.

Second, the fact that the model in the Godwins report cannot be evaluated by the traditional measures of forecast accuracy does not mean

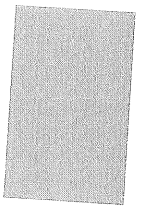
that the model cannot be checked against reality. The parameters in the model were calibrated so that the values of labor share of total cost, and the share of employment covered by SFAS 106 produced by the model matched up with actual values of these numbers.

Third, our confidence in the model's numerical results is bolstered by the sensitivity analysis which indicates that our results are quite robust to changes in the values of the model's parameters.

Response to request (5): provide the results of any sensitivity analyses performed to determine the effect of using different assumptions.

As mentioned above, Section IV of the Godwins report, pp. 34-43, is devoted to the sensitivity analysis. In particular, pp. 37-39 specifically discuss the sensitivity analysis of the macroeconomic model. The numerical results of the sensitivity analysis are presented in the table on page 41.

Attachment E - 1992 Rebuttal Analysis for Godwins Study



Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

92-101

In the Matter of:	)	
	)	
Treatment of Local Exchange Carrier Tariffs Implementing Statement of Financial Accounting Standards, "Employers Accounting for Postretirement Benefits Other Than Pensions"	)	CC Docket No. [redacted]
	)	
Bell Atlantic Tariff FCC No. 1	)	Transmittal No. 497
	)	
U S West Communications, Inc. Tariff FCC Nos. 1 and 4	)	Transmittal No. 246
	)	
Pacific Bell Tariff FCC No. 128	)	Transmittal No. 1579

REBUTTAL TO OPPOSITIONS TO DIRECT CASE OF THE UNITED STATES TELEPHONE ASSOCIATION

Martin T. McCue
General Counsel

Linda Kent
Associate General Counsel

900 19th Street, NW, Suite 800
Washington, D.C. 20006-2105
(202) 835-3100

July 31, 1992

SUMMARY

USTA provides a detailed response to the objections raised by the opposing parties prepared by Godwins regarding its study. The response clearly refutes the objections and demonstrates that the Bureau can rely on the soundness of the study and the validity of its results in recognizing OPEB costs as exogenous for price cap purposes.

USTA also rebuts assertions made that OPEB costs have already been reflected in the Commission's latest represcription.

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Pacific Bell Tariff FCC No. 128	)	Transmittal No. 1579

REBUTTAL TO OPPOSITIONS TO DIRECT CASE OF THE UNITED STATES TELEPHONE ASSOCIATION

The United States Telephone Association (USTA) respectfully submits its Rebuttal to the Oppositions to Direct Case which were filed July 1, 1992 in the above-referenced proceeding.

I. INTRODUCTION.

In its Direct Case, USTA supported the exogenous treatment of the incremental costs of implementing Statement of Financial Accounting Standards -106 (SFAS-106), "Employers Accounting for Postretirement Benefits Other Than Pensions" (OPEB). USTA commissioned the Godwins study, "Post-Retirement Health Care Study Comparison of TELCO Demographic and Economic Structures and Actuarial Basis National Averages" (1992). That study analyzes the impact of SFAS-106 on GNP-PI and, in particular, the extent to which the GNP-PI will reflect the increase in costs

experienced by exchange carriers as a result of implementing SFAS-106. The study shows that the impact of implementing SFAS-106 will not be double-counted within the context of the price cap formula.

In Oppositions filed July 1, 1992, AT&T, MCI, Ad Hoc Telecommunications Users Committee (Ad Hoc) and ICA attempted to raise objections to the Godwins study. MCI, Ad Hoc and ICA also allege that the impact of implementing SFAS-106 was reflected in the latest Commission represcription of exchange carriers' rate of return. USTA will refute these points in its Rebuttal.

II. GODWINS STUDY.

Attached hereto is a detailed response to the objections raised by the opposing parties prepared by Godwins. The response clearly refutes the objections and demonstrates that the Bureau can rely on the soundness of the study and the validity of its results in recognizing OPEB costs as exogenous for price cap purposes.

The response first discusses the issue of double counting. The Godwins study addresses double counting which could occur in the increases in the PCI due to increases in the GNP-PI caused by companies with OPEB liabilities reflecting those costs through higher prices. No opposing party casts doubt on any of the basic findings of the study. Therefore, the Bureau should adopt the study's conclusion that double counting could account for 0.7

percent of the increase in costs attributable to SFAS-106, that 14.5 percent of the increase could be recovered through a reduction in the national wage rate and that the remaining 84.8 percent of the increase in costs are exogenous.

The response clarifies a misconception of the opposing parties by explaining that it is the increase in expense due to the SFAS-106 accounting change that should be afforded exogenous treatment, and not the SFAS-106 expense.

The response explains that the alternatives suggested by opposing parties to determine the extent of double counting do not even address the true source of potential double counting.

Second, the Godwins response refutes objections raised regarding the actuarial analysis. Godwins points out that AT&T's contention that the study is flawed because the government sector is excluded is based on a misstatement of fact. MCI's criticism regarding the use of data from only one insurance company only demonstrates that MCI failed to appreciate the validity of the data and how it was utilized in the study. Godwins also addresses Ad Hoc's contention that it did not include the effect of "standard error".

The response supports the reasonableness of the actuarial assumptions utilized in determining the ratio of GNP-BLI to TELCO-BLI. In addition, Godwins reaffirms its finding that labor

costs of non-exchange carrier firms sponsoring retiree medical plans will increase 3.19 percent as a result of SFAS-106.

Godwins also responds to objections regarding the macroeconomic analysis.

Finally, Godwins rebuts the report prepared by Economics and Technology, Inc. (ETI). As Godwins explains this report is unprofessional in that it contains numerous misrepresentations and distortions.

III. RATE OF RETURN REPRESCRIPTION.

The opposing parties have missed the point in assuming that the latest Commission represcription of rate of return made exchange carriers whole.[1] Specifically, ETI contends that exchange carriers have ignored economic effects to the extent that SFAS-106 liabilities were reflected in RBOC share prices as used by the Commission in setting the rate of return. MCI states that SFAS-106 costs were embedded in the initial price cap rates and that to provide exogenous treatment for these costs would result in double counting. This claim is supported in an affidavit attached to MCI's filing by Professor Allan Drazen.

In stating these claims, the opposing parties are simply making the wrong argument on several counts. First, they have ignored the fact that exchange carriers are regulated on their

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[1] See, Comments of Ad Hoc at p.17 and MCI at pp.11-17.

accounting records. In monitoring a company's books, the regulator must recognize any change in accounting rules that affects the company's earnings which is not otherwise accounted for and make an adjustment for the change. The regulator, by setting a fair rate of return, has not obviated the obligation to compensate the company for any reasonable and necessary expenditures.

Second, the opposing parties have completely missed the link between risk and return. They have not shown any changes in the cost of capital caused by changes in company risk or changes in capital market conditions. They have simply contended that a postulated change in the stock price of a company automatically implies a change in the cost of capital. Their arguments are both unsupported and erroneous. Changes in the cost of capital are caused by changes in risk, not simply by a change in stock price, as the opposing parties contend. In fact, the Commission has stated that "(a)n increase in the price of a stock, however, may leave the stock's expected return unchanged if the price rose to adjust for higher anticipated profits rather than lower investor perceived risk."[2]

The existence of post-employment medical liabilities is not new to analysts and investors. The extent to which these

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[2] Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers, CC Docket No. 89-624, Order, 5 FCC Rcd 7507, released December 7, 1990 at paragraph 133.

liabilities were incorporated in the stock price of a company was not affected by or based on the adoption of SFAS-106. Such liabilities were always an economic reality. The only thing the adoption of SFAS-106 did was to affect the accounting of these costs and, potentially, the recovery of these costs through rates. If stock prices were reduced by these liabilities, it was not due to SFAS-106. Further, even if stock prices were reduced by expectations, the need for exogenous treatment has not been eliminated.

As the Commission was considering the represcription of rates for exchange carriers, recovery of SFAS-106 costs was a reasonable expectation of the investment community. Exchange carriers expected that changes to GAAP would be exogenous and that an accrual account for retiree nonpension benefits would require a GAAP change. The record before the Commission reflected a consensus on this issue:

> USOA Changes. All those commenting on the treatment of costs attributable to changes in our Uniform System of Accounts agree that these costs should be considered exogenous. ... Nonetheless, because changes in GAAP cause changes in the regulatory accounting procedures of carriers under our jurisdiction only after we find such changes compatible with our regulatory accounting needs, we conclude ... that AT&T should adjust its price cap to reflect such changes in GAAP only after we have approved such a change. We now propose the same treatment of GAAP changes for the LECs.[3]

Exchange carriers expected that accrual accounting for

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[3] Policy and Rules Concerning Rates for Dominant Carriers, CC Docket No. 87-313, Report and Order and Second Further Notice of Proposed Rulemaking, 4 FCC Rcd 2873, released April 17 1989, at paragraph 654.

retiree nonpension benefits would require a GAAP change.

The Commission did not further address exogenous cost treatment of either GAAP changes, USOA changes or SFAS-106. Thus, no indication was given to investors by the Commission that price cap exchange carriers would not receive exogenous cost recovery for the incremental SFAS-106 costs imposed by the GAAP change. In fact, it was expected that price cap exchange carriers would obtain increased revenues to cover the increased costs of SFAS-106 implementation.

The ETI report states that SFAS-106 costs "were reflected in the share prices of the LEC and other firms evaluated by the FCC for the rate of return represcription upon which the LEC price cap plan was based" and that "the Commission should fairly conclude that SFAS-106 effects already are discounted to some degree in the existing nationwide average rate of return prescribed for all carriers."[4] ETI supports this statement by noting that "a large data base of health care prices, costs, employee contributions and co-payments, eligibility requirements, deductibles and other insurance requirements" was available to "actuaries, securities analysts, insurance and benefits consultants and any other analyst who may have cared to compute potential long-term health care costs for any segment of the

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[4] Opposition of the Ad Hoc Telecommunications Users Committee to Direct Cases, filed July 1, 1992, at Appendix I, p.2.

population."[5]

In addition, the ETI report states that:

> the FCC's represcription of the industry-wide rate of return for LECs explicitly relied upon Institutional Brokers Estimate Service (IBES) data on dividends, earnings and stock prices as part of the discounted cash flow analysis used to establish the prescribed return on equity. IBES data were determined by the FCC to be a reasonable expectation of investor expectations.[6]

The ETI report neglects to point out that if the prospect of SFAS-106 costs would impact stock prices, it should also impact dividend and earnings growth expectations, for it is these very expectations which affect stock prices. It follows then that, just as the pressure on stock prices would presumably be downward, so would the impact on dividend and earnings growth expectations (absent exogenous treatment, obviously). Therefore, if stock prices are lower and if dividend and earnings expectations are lower, it is entirely possible, even likely, that the cost of equity would be largely unaffected, certainly not higher as ETI contends.[7]

MCI makes the same error as ETI. Both consider one variable in the equation, that is, purported stock price effects. Curiously, however, they do acknowledge the impact on earnings expectations, but not in any quantitative way, when they state

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[5] Id. at p.11.

[6] Id.

[7] The opposing parties all reference the Discounted Cash Flow (DCF) analysis when discussing the cost of equity, whereby cost of equity is the sum of the dividend yield and expected growth in dividends.

that "(a)ny negative consequence to earnings or profitability caused by the expectations of SFAS-106 costs was recognized by the market participants and resulted in downward adjustment to the price of the stock."[8] This lack of recognition of the "negative consequence to earnings" is amply demonstrated in the affidavit prepared by Professor Drazen where the author refers only to "the effect that the anticipated adoption of SFAS-106 may already have had on the price of the LECs' stock and hence on the rate of return to capital on which current rates are based."[9]

Apparently Professor Drazen is not completely unaware of the effect on growth expectations, as he goes on to state:

> (t)he cost of equity calculated by the DCF formula is the sum of the dividend yield and an estimate of the long-term growth in dividends G. A future regulation such as SFAS-106, which is anticipated to induce a discrete downward adjustment in accounting profits when first adopted but whose exact initial impact is uncertain, should have a clear effect in reducing the stock price but a far less clear effect on estimates of G.[10]

Drazen further contends that:

> when there is agreement on the direction of the effect of a regulation on profitability, but uncertainty about its exact impact before it is adopted, there will be a fall in the stock price, and hence an increase the yield (sic) and in the cost of equity as measured by the DCF formula before the regulation is adopted.[11]

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[8] Opposition of MCI Telecommunications Corp. Direct Cases, filed July 1, 1992, at Appendix A, p.15. [MCI Appendix A.]

[9] Id. at p.2.

[10] Id. at p.3.

[11] Id. at p.4.

Is the Commission to believe, then, that because there is purportedly uncertainty regarding the magnitude of the effect on G, it is to be ignored? Surely, without adequate rate recovery, there is no such uncertainty regarding the direction of the impact on G. In fact, later on, Professor Drazen admits there is some uncertainty in the measure of the "increase in the present discounted value of anticipated retiree health liabilities" presented in the referenced Mittelstaedt and Warshawsky study [Warshawsky] when he allows "(t)his estimate has a large confidence interval however."[12] He further states that "(t)he Warshawsky estimates suggest that with the high degree of uncertainty regarding the impact of SFAS-106 before it was adopted, there was a clear depressing effect on stock prices."[13]

It is, therefore, hard to reconcile this admitted "uncertainty" and "large confidence interval" with Professor Drazen's premise that there will be a "clear effect in reducing the stock price"[14] and his decision not to incorporate any effect on dividend and earnings growth expectations. Clearly, this sort of implementation of the DCF would lead to upwardly biased estimates of the cost of capital and not a "true" adjustment to the cost of capital as postulated by the author.

The Warshawsky estimates are founded on unsupported

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[12] Id. at p.5.

[13] Id.

[14] Id. at p.3.

assumptions, which may be the reason for the lack of statistical robustness in the results. The authors themselves admit this imprecision in their own abstract. "(R)esults suggest that market estimates of the liabilities are imprecise. To the extent that the imprecision is due to insufficient accounting disclosures, significant price adjustments, upward and downward, may occur when information required by a new accounting standard is disclosed."[15]

Drazen's contention that "(t)he possibility that an anticipated future cost increase will be reflected in a higher current cost of equity is noncontroversial in theory,"[16] is contradicted in the same article used in Warshawsky's paper:

> Although many corporate executives concede that the new rule would slash reported earnings and reduce book values substantially, the FASB proposal so far has caused little stir on Wall Street. ... Shrugs Lee Seidler, an accounting specialist with Bear Stearns, "It will be a big yawn."[17]

Additional evidence on the lack of consensus among analysts and investors of the impact of SFAS-106 on stock prices at the time of the Commission's represcription is evident in the same article:

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[15] M. Warshawsky, "The Impact of Liabilities for Retiree Health Benefits on Share Prices," Finance and Economics Discussion Series paper 156, Division of Monetary Affairs, Federal Reserve Board, Washington, D.C., April 1991, Abstract. (Emphasis added.)

[16] MCI Appendix A at p.4.

[17] Henriques, Barron's, April 17, 1989 at p.8.

> Only about a fourth of the corporations surveyed in Foster Higgin's annual health care benefits survey have even a rough idea of what their potential liabilities would be under the FASB proposal, says Pat Wilson. "Do they know the general magnitude? Yeah, they have a feel for it. They know if it's bigger than a bread-box, smaller than a battleship. But do they know what the effect will be on their income statement over time? No. The percentage that really knows that is much, much lower."
>
> But, however slow corporations have been to assess the potential consequences of the FASB rule, they're leagues ahead of Wall Street.
>
> "I don't think anyone even has a good idea of how to start dealing with this, how to develop the logic by which they can anticipate who would be affected," admits Robert Willens, a senior vice president at Shearson Lehman Hutton. There's a large body of people who think this will never get implemented, so they just haven't given it much thought."[18]

The sole quote relied on by Warshawsky, by an analyst at Salomon Brothers, was immediately followed in the article by this statement:

> Willens doesn't buy that. "I don't see how that could be the case when people are just now beginning to get an idea of the potential implications," he protests. "They're not even close to being reflected in the stock price."[19]

The underlying weakness in all of the arguments made to support the view that the cost of capital, as estimated by the Commission, already contains a premium to account for SFAS-106 costs is quite straightforward. Any perceived stock price effects are caused by possible changes in dividend and earnings growth assumptions. The stock price effects do not materialize on their own, the two go hand-in-hand. Even Professor Drazen

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[18] Id.

[19] Id. at p.9.

acknowledged this linkage when he states that "(e)fficient markets theory argues that a future anticipated change in cost and hence earnings will be reflected in current stock prices."[20] The opposing parties have taken a postulated change in stock prices and imputed a change in cost of capital completely at odds with the literature they cited and with the Commission's own statements and in violation of their reliance on the DCF method to estimate the cost of equity.

IV. CONCLUSION.

Based on the foregoing, USTA urges the Commission to recognize OPEB costs as exogenous for price cap purposes.

Respectfully submitted,

UNITED STATES TELEPHONE ASSOCIATION

By Linda Kent

Martin T. McCue
General Counsel

Linda Kent
Associate General Counsel

900 19th Street, NW, Suite 800
Washington, D.C. 20006-2105
(202) 835-3100

July 31, 1992

Attachment

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[20] MCI Appendix A at p.3.

CERTIFICATE OF SERVICE

I, Robyn L.J. Davis, do certify that on July 31, 1992 copies of the foregoing Rebuttal to Oppositions to Direct Case of the United States Telephone Association were either hand-delivered, or deposited in the U.S. Mail, first-class, postage prepaid to the persons on the attached service list.

Robyn L.J. Davis

Francine J. Berry
David P. Condit
Judy Sello
295 North Maple Avenue
Room 3244J1
Basking Ridge, NJ 07920

Brian R. Moir
Fisher, Wayland, Cooper & Leader
1255 23rd Street, NW
Suite 800
Washington, DC 20037

William Page Montgomery
David J. Roddy
Economics and Technology, Inc.
One Washington Mall
Boston, MA 02108

James S. Blaszak
Charles C. Hunter
Gardner, Carton & Douglas
1301 K Street, NW
Suite 900
East Tower
Washington, DC 20005

Michael F. Hydock
MCI
1801 Pennsylvania Ave., NW
Washington, DC 20006

Robert B. McKenna
U S West
1801 California
Suite 4700
Denver, CO 80202

Lawrence Katz
Bell Atlantic Companies
1710 H Street, NW
8th Floor
Washington, DC 20006

Gail L. Polivy
GTE
1850 M Street, NW
Suite 1200
Washington, DC 20036

James P. Tuthill
Pacific Telesis Group
140 New Montgomery Street
San Francisco, CA 94105

James B. Curtin
Anne W. MacClintock
SNET
227 Church Street
New Haven, CT 06506

Floyd S. Keene
Brian R. Gilomen
Ameritech Operating Cos.
2000 West Ameritech Center Drive
Hoffman Estates, Il 60196

William A. Barfield
M. Robert Sutherland
BellSouth
1155 W. Peachtree Street, NE
Suite 1800
Atlanta, GA 30367

Saul Fisher
NYNEX
120 Bloomingdale Road
White Plains, NY 10605

Josephine S. Trubek
Rochester Telephone Corp.
180 South Clinton Avenue
Rochester, NY 14646

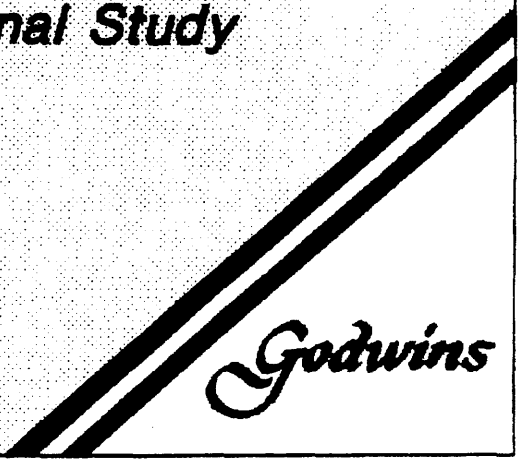
United Telephone System
P.O. Box 7927
Overland Park, KS 66207

Downtown Copy Center
1114 21st Street, NW
Washington, DC 20036

UNITED STATES TELEPHONE ASSOCIATION

Analysis of Impact of SFAS 106 Costs on GNP-PI

Supplemental Report:
Responses to Objections Raised
Regarding Original Study



July, 1992

INTRODUCTION

Earlier this year, Godwins submitted a report to the United States Telephone Association (USTA) analyzing the impact of SFAS 106 on the GNP-PI, and, in particular, the extent to which the GNP-PI will reflect the increase in costs experienced by the Price Cap LECs as a result of adopting the new accounting standard. This report was placed on the record with the FCC in Bell Atlantic's Tariff Transmittal filed on February 28, 1992 (Transmittal No. 497) and was also included in U.S.West's Tariff Transmittal filed on April 3, 1992 (Transmittal No. 246).

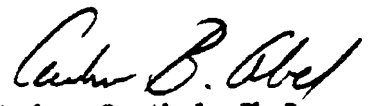
In their filings with the FCC, several organizations took exception to the findings of that report. In particular, AT&T, MCI and the Ad Hoc Telecommunications Users Committee raised several objections with regard to various aspects of the study. The USTA has asked Godwins to provide a detailed response to each of those objections.

The purpose of this Supplemental Report is to provide the USTA with those responses. We have organized our responses into three sections, corresponding to the three different types of objections raised.

While the objections raised were numerous, this material will demonstrate that none of the objections raised should cause the Commission to have any doubts regarding the soundness of the study, or the validity of the results.

Respectfully Submitted,

Peter J. Neuwirth, F.S.A., M.A.A.A.



Andrew B. Abel, Ph.D.

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SECTION I

RESPONSE TO OBJECTIONS REGARDING OVERALL STUDY

A. Definition of Double Count

There were two objections raised with respect to the manner in which we defined the potential sources of double counting and what sort of analysis would be required to eliminate any double counting in determining the portion of the LECs' SFAS 106 costs that should qualify for exogenous treatment.

AT&T Contention (Pages 6 and 7) - "The LEC's have failed to demonstrate that the Commission's third criteria is met. To the contrary, the LECs' requests for exogenous treatment appear to reflect certain OPEB costs that will be reflected in the GNP-PI ... The double count occurs because (i) the GNP-PI component of the PCI will increase as all firms with OPEB liabilities reflect those costs through higher prices, and (ii) the SFAS 106 accrual calculation includes the present value of future inflation. If the SFAS 106 accrual is afforded exogenous treatment, the amount of the accrual will be increased automatically in future periods due to growth in inflation expressed by the GNP-PI component of PCI.** Therefore, if inflation is included in both the exogenous cost component and GNP-PI, an LEC would be compensated twice. Although the LECs recognize this problem, no carrier has met its burden of showing that it has effectively removed this double count."

Response - AT&T's description of what it considers the source of potential double counting in the LECs' request for exogenous treatment for increased costs due to SFAS 106 demonstrates some confusion as to both the double count problem and the Godwins Report. Essentially AT&T suggests that double counting may arise from two separate sources:

(1) Increases in the PCI due to increases in the GNP-PI caused by "firms with OPEB liabilities reflect(ing) those costs through higher prices."

(2) Automatic increases in the exogenously treated portion of SFAS 106 accrual "due to growth in inflation expressed by the GNP-PI component of PCI."

The first source of potential double count, while a valid concern, is precisely the factor that the Godwins Report directly and thoroughly addresses. The first paragraph of page 1 of the Godwins Report explicitly states this as the primary objective of the study. As will be seen in the responses to specific criticisms of the Godwins Report, no respondent has raised any issue which, upon scrutiny, casts doubt on any of the basic findings of the study. Therefore, the Commission should accept the Report's conclusions that (a) this source of double count accounts for 0.7% of the increase in costs attributable to SFAS 106, (b) another 14.5% of the increase will be recovered through a reduction in the national wage rate, and (c) the remaining 84.8% of such increase in costs will remain unrecovered unless exogenous treatment is granted on this amount.

The second alleged source of double counting simply doesn't exist, and is the result of confusion over exactly what the LECs are requesting. While it is true that the SFAS 106 expense calculation includes the present value of future inflation, and that the expense calculated under SFAS 106 can be expected to increase each year at something close to the rate of inflation, SFAS 106 expense is not what the LECs are requesting exogenous treatment on. It is the increase in expense due to the SFAS 106 accounting change that should be afforded exogenous treatment. This is an absolutely critical distinction which is missed by AT&T. Retiree medical plans were sponsored by firms before and after SFAS 106 was issued. It is only the accounting for those plans that has changed, and it is the increase in costs associated with this change in accounting that must be evaluated.

MCI Contention - (Page 30)

"If one were to include SFAS 106 costs through exogenous treatment, the revenues resulting from the increase in the price cap index to account for these costs would also increase each year by the GNP-PI, as adjusted for the productivity factor. The problem is that SFAS 106 costs have already been adjusted for future inflation...Therefore, the impact of medical care cost inflation has already been counted. As such the amount offered by the LEC's has been inflated to reflect future medical costs. To include these costs again within the price cap formula through exogenous treatment, and treat them by the full amount of GNP-PI which has medical inflation embedded as well is tantamount to double counting the medical care inflation rate."

Response -

This contention is virtually identical to the second "source" of double counting outlined by AT&T on page 7 of its filing with the Commission. Rather than repeat our response to that contention, we would just point out that, like AT&T, MCI seems to have failed to grasp the point that the LECs are not asking for exogenous treatment on the SFAS 106 expense, rather they are asking for exogenous treatment on that portion of the increase in expense due to the mandated accounting change, which will not already be reflected in GNP-PI increases caused by that accounting change.

B. Avoidance of Double Count

Two respondents suggested "better" ways of determining the extent of the double count problem, and therefore "better" ways of determining the appropriate portion of SFAS 106 costs that should qualify for exogenous treatment.

AT&T Contention - (pp. 13 - 14)

"....The Commission should require the LEC's to use an alternative that is both a simpler and more reliable means for correcting the double count. AT&T suggests that the appropriate method for removing the double count between the SFAS 106 accrual and the GNP-PI term in the price cap formula is to remove the impact of expected changes in GNP-PI from the SFAS 106 accrual. This can be accomplished in a straightforward manner by requiring the LEC's to subtract the expected rate of change of GNP-PI from the health care inflation component in the SFAS 106 accrual. The Commission should specify the changes in GNP-PI over the SFAS 106 forecast period. Current estimates is (sic) that GNP-PI will increase approximately 4% over the long term."

Response -

That AT&T should suggest such an illogical and erroneous "solution" to the double count problem is indicative of a failure to understand the true source of any potential double counting. As discussed earlier, potential double counting is not related to the fact that SFAS 106 costs are calculated by discounting future medical inflation back to the present. As discussed on page 2 of this material, double counting will only arise to the extent that the increased costs companies will bear, as a result of the change in accounting method required by SFAS 106, will also cause an increase in GNP-PI.

The fact that the AT&T "solution" does not address the true source of potential double counting is illustrated in the following example, where the AT&T solution is shown to produce an identical exogenous adjustment in two factually different circumstances, where logic would dictate different exogenous adjustments be applied.

In the second footnote on page 13 of its filing, AT&T estimates that its "solution" of allowing exogenous treatment for SFAS 106 accruals, calculated using a medical trend rate 4% lower than the actual rate used by the LECs for their financial statements, might result in approximately 55% of a given LEC's actual SFAS 106 accrual being afforded exogenous treatment. Now let us consider two hypothetical scenarios:

(1) Every U.S. firm, LECs and non-LECs alike, have identical demographic makeups and provide identical retiree medical benefits. Thus, in this case, presumably every U.S. firm would experience the same increase in labor costs due to SFAS 106. In addition, under this scenario, it is assumed that all labor cost increases associated with SFAS 106 are completely reflected in the GNP-PI, as companies raise their prices to recover those costs.

(2) The LECs are the only firms subject to SFAS 106, and/or the additional costs due to the adoption of SFAS 106 costs are never reflected in the GNP-PI.

In the first scenario, it is obvious that the increased labor costs due to SFAS 106 experienced by the LECs would be fully and completely reflected in the GNP-PI (the Godwins Report, of course, demonstrates that this hypothetical situation does not exist), and thus no exogenous adjustment would be required. In fact, in this hypothetical scenario, providing any exogenous adjustment would result in a complete double count. Yet in this circumstance, the AT&T approach of allowing recovery of SFAS 106 costs, calculated using a lower trend rate (medical inflation minus 4%), would, as noted above, result in allowing exogenous treatment on 55% of SFAS 106 accruals.

Conversely, under the second scenario, the LECs should receive an exogenous adjustment equal to 100% of their increased costs due to SFAS 106, because the double count problem simply wouldn't exist. Yet in this circumstance as well, the AT&T approach would allow an exogenous adjustment for the same 55% of SFAS 106 accruals as before. This is clearly an illogical result.

One can therefore see that AT&T's suggested approach to the double count does not address the specific factors that affect the extent of double count, i.e.:

- Differences in plans between the LECs and non-LECs

- Differences between the LECs and non-LECs which will give rise to different SFAS 106 costs (e.g., demographic differences).

- Proportion of increased aggregate labor costs due to SFAS 106, that in fact is reflected in GNP-PI.

As noted, it is precisely these critical factors detailed above that are addressed completely and comprehensively in the Godwins Report.

MCI Contention - (Page 31)

"If the Commission does decide to afford these LECs exogenous treatment for SFAS 106 costs, this double counting must be eliminated. This can be accomplished either through the removal of medical care inflation from the GNP-PI or through the removal of medical care inflation from the SFAS 106 accruals."

Response -

While this "solution" differs slightly from AT&T's suggested "solution" (pages 13-14 of its filing) in that MCI focuses on the medical care inflation component of GNP-PI, conceptually it is very similar, and suffers from the same

fundamental flaws as the AT&T suggestion. As with AT&T, the MCI suggestion simply doesn't address the source of any potential double count. The double count does not arise from the discount of future inflation, but only from the differential impact of SFAS 106 on the LECs relative to others, and the extent to which the price cap index will allow the LECs to recover some of those additional costs, as the macroeconomic effects of the introduction of SFAS 106 are reflected in the economy as a whole. As with the AT&T solution, the MCI solution produces the same exogenous adjustment, whether in reality there is no double counting (no non-LEC firm incurs SFAS 106 costs), or complete double counting (all firms, including LECs, experience identical increases in costs due to SFAS 106, and the GNP-PI fully reflects those increased costs). This is clearly an illogical result.

SECTION II

RESPONSE TO OBJECTIONS REGARDING ACTUARIAL ANALYSIS

A. Methodology

There were three objections raised with respect to the basic methodology employed in the actuarial analysis undertaken by Godwins.

AT&T Contention - (pp. 11 -12)

"... the study is flawed because the government sector is not included. Although SFAS 106 does not affect the accounting practices of the government, growth in retirement health care costs for the government sector of the economy will affect the growth in GNP-PI because GNP-PI includes government SFAS 106-like OPEB expense... If OPEB-related expenses of the government were included in the analyses, the GNP-PI would be higher, and this would have the effect of reducing the amount of the LEC's SFAS 106 expense potentially eligible for exogenous recovery."

Response -

AT&T's contention that the exclusion of the government sector from the analysis results in an overstatement of the amount of the LECs' SFAS 106 expense eligible for exogenous treatment is completely invalid, because it is based on a misstatement of fact. The statement that "the GNP-PI includes government SFAS 106-like OPEB expense" is simply wrong. Government entities are not subject to SFAS 106, nor are they required by the Government Accounting Standards Board (GASB) to account for retiree medical benefits on anything other than a "pay-as-you-go" basis. It must be emphasized that the critical issue is not what effect will the increase in the "pay-as-you-go" costs of retiree medical plans have on GNP-PI. (The GNP-PI will increase due to increases in "pay-as-you-go" costs, regardless of whether SFAS 106 ever becomes effective.) Rather, the critical question is what effect will there be on GNP-PI, due to the requirement that private sector employers change the way in which they account for retiree medical plans. As AT&T

itself concedes, government sector employers are not required to change their accounting for retiree medical plans, and therefore the fact that many governmental entities sponsor such plans is not relevant to the analysis. As a result, the Godwins Report considered the government sector (see page 21 of the study), and correctly excluded it from the covered population for the calculation of the increase in labor costs experienced by firms subject to SFAS 106.

MCI Contention - (Page 26) "The USTA study uses data from only one insurance company to arrive at the cost of medical claims for the calculation of the nationwide Benefit Level Indicator."

Response - The inferred intent of the MCI comment is to suggest that Godwins used "data from only one insurance company" to come up with per capita claim costs, which were then used to derive aggregate SFAS 106 costs for the U.S. as a whole. MCI has clearly failed to appreciate the validity of the data, and the limited use to which the insurance company claims data was put. In particular,

(1) The insurance company used is, by any measure, one of the five largest Life and Health insurance carriers in the United States.

(2) The data collected was for gross medical claims, not amounts reimbursed by company plans.

(3) The data was sufficiently extensive to ensure that no statistical fluctuations (i.e., sampling errors) would materially affect the results.

(4) The data was used to form a frequency and amount distribution, against which actual plan provisions of the LECs and the companies in the Godwins database were applied, to evaluate the relative benefit levels of the TELCO plans compared to those provided by other employers.

(5) Changes in the underlying distributions derived from the insurance company data would not have had any significant effects on the ultimate result. This is because the key results of the Godwins study were related to the ratio of the GNP-BLI to TELCO-BLI, and not to the absolute value of either.

Ad Hoc Contention (ETI) (Page 21) - "Finally, the Godwins Report ignores *the usual uncertainty that is associated with survey results measured by calculated standard errors.* As we discussed, Godwins utilized data from a survey of 830 employers who sponsor post-retirement plans and 170 employers who do not. It is a well accepted fact that data from surveys are subject to uncertainty which is usually measured by the standard error.* However, these standard errors are never taken into account in the calculation of the Benefit Level Indicators (BLIs). Thus the data shown in the table on page 28 of the Godwins Report assumes that the standard deviation is zero. This is obviously incorrect. Furthermore, there is no information as to the variance or the standard deviation of the sample data so that the sensitivity of the results can be analyzed. Combined with the fatal errors discussed above, this shows a report which was designed to come to a particular conclusion favorable to the LEC's."

Response - The "standard error" for the calculation of the average Benefit Level Indicators was not shown[1] because in this case, the effect of the "standard error" was deemed to be

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1 Ad Hoc references page 28 of the Godwins Report. We assume that they are referring to the table shown on page 16 of the report since there is no table nor any data appearing on page 28 of the Godwins Report.

immaterial. The reason it is immaterial is that the Godwins data is not a "survey" in the traditional sense of the word (i.e., a small sample from a large universe); rather, it is a data base comprising companies that employ approximately one-half of all employees who work for companies that provide post-retirement medical benefits.

However, in the interest of completeness, we have included in Appendix A the calculation of the variance and standard deviation, which are inherent in the calculation of the average BLIs used in the Report. As can be seen from the exhibits, the standard deviation for the average pre-65 BLI is .015, while the standard deviation for the post-65 BLI is a mere .008. Had the average BLIs been one standard deviation higher than the values actually used for both the pre-65 and the post-65 BLI, the relative impact of SFAS 106 on GNP compared to TELCO would have increased from 28.3% to 29.1%. Given that the sensitivity analysis of the overall result utilized a range for this value of 17.8% to 44.5%, it is quite clear that the effect of the "standard error" referred to by ETI is immaterial.

B. Actuarial Assumptions

There was one objection raised regarding the reasonableness of the assumptions utilized in determining the ratio of GNP-BLI to TELCO-BLI.

MCI Contention - (Page 28) FN 35

"Within the USTA study, in its flawed attempt to estimate relative benefit ratio levels, the consultant utilizes turnover rates that are markedly lower than the average turnover rate. This results in inflated estimates of the OPEB liability. Like most of the assumptions used by USTA, the grounds for this are unsupported. USTA remarks that it chose this estimate because of the historical patterns of longer service life and higher average age for TELCO employees versus other employees. Unfortunately, the study does not indicate what time frame was used for this comparison, or whether the experience of the last few years, with the large amount of downsizing exhibited by the TELCO firms, has been included."

Response -

There appear to be two contentions made in MCI's comment. First, that the Godwins study did not use the "average turnover rate" for TELCO and second, that even if the average rate, based on "historical patterns of longer service life and higher average age" were used, such turnover rates would still be too low because of "the large amount of downsizing exhibited by the TELCO firms."

With respect to the first contention, the turnover rates used for TELCO (T-2) are the average of the rates used by the LECs in their most recent actuarial studies (generally 1990 or 1991). With respect to the second contention, downsizing through Early Retirement programs should not have any impact on assumed turnover rates because such turnover rates are only utilized for projecting future pre-retirement withdrawals. This should be obvious since an individual is no longer subject to the turnover rates once that individual becomes eligible for retirement.

Further, MCI seems to have misinterpreted the statement made

in the Godwins Report (page 48-FN 3) that,

> "Supporting evidence for low incidence of turnover at TELCO relative to national average can be seen by the higher average age and past service of TELCO employees relative to average age and service of national working population."

The point here is not that there have been "historical patterns of longer service life and higher average age for TELCO employees," but rather that the <u>current</u> age/service characteristics of TELCO (age = 41.6 / service = 16.6, as of 1/1/91) provide evidence of low turnover rates (i.e. <u>low turnover rates</u> in the past <u>produced</u> the current demographic makeup of the group). Recent downsizing could not have contributed to producing these age/service characteristics because recent staff reductions among the LECs were <u>not</u> accomplished through layoffs among the younger short-service employees prior to 1991.

While the above concept is well known among professional actuaries, we have performed some additional analysis and provided a more detailed explanation below, which should make our point somewhat clearer.

The average age and service of an employee group is not a simple function of withdrawal rates, but higher withdrawal will generally push down averages.[2]

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2 The fact that the average age of a population will increase if mortality rates are reduced is obvious. It can also be shown that a similar effect occurs in a company's "population". An employee group has exits from death, retirement, and termination, which exits correspond to mortality in the general population. Population growth, the growth of the firm, and the economic cycle all affect the number and average ages of replacements, which replacements correspond to births in the general population. Since the calculations for TELCO were based on very large employee groups, the variations in growth of firms cannot hide the effect of withdrawals.

Calculations were performed to test the hypothesis that the "T_6 / T_2" choice of withdrawal tables was consistent with the observed differentials between average age and average service of TELCO compared to the nation as a whole. With hire age and retirement age as parameters for calculating the average age and average service of stationary populations resulting from T_2, T_6, and T_{10} based upon all retirements at a given retirement age and all hires at a given hire age, the table in Appendix B clearly indicates differences that are not only consistent with the results shown in the Godwins Report, but in fact suggest that the differences in turnover rates between TELCO and the rest of the U.S. working population may be even greater than T-2 versus T-6.

For example, if one were to look at a company that hires new employees at an average age of 27, that experiences turnover rates equal to T-2, and retirements at age 62 (a situation not unlike TELCO), one would find that after this company matures it can expect to have an employee population with an average age of 41.54, and an average past service of 14.54 years. If, instead, turnover rates equal to T-6 were applied, the average age and service of the population would be 38.80 and 11.80, respectively. This theoretical difference, between populations subject to T-6 and T-2, is actually less than the observed differences in age/service characteristics between TELCO and the non-TELCO firms (see page 47 of the Godwins Report). While TELCO and the rest of the GNP have different retirement patterns, it can be seen from the table that differences in average retirement ages have only a minor impact on the basic result.

Finally, it should be noted that the sensitivity analysis performed by Godwins is more than sufficient to allow for any potential understatement of TELCO's turnover rates. On

pages 34 and 35 of the Godwins Report, it is shown that even if the same turnover rates were used for both TELCO and the rest of the working population, the relative impact of SFAS 106 on GNP, compared to TELCO, would only increase from 28.3% to 34.6%. As noted on page 40 of the Godwins Report, overall results are shown using values for this relative impact, ranging from 17.8% to 44.5%.

C. Accuracy and Reliability of Results

There were two objections raised with respect to the overall accuracy and reliability of the Godwins findings that labor costs of non-LEC firms sponsoring retiree medical plans will increase 3.19% as a result of SFAS 106.

AT&T Contention - (pp. 9 - 10) "The results of the Godwins Study depend on the calculation that the adoption of SFAS 106 will increase labor costs by 3% for firms incurring OPEB expenses. The 3% estimate is derived using numerous factors, each subject to error as noted in Godwins' section on sensitivity of results (pp. 34-43). The cumulative impact of reasonable variations in each factor renders the 3% estimate suspect."

Response - It is precisely the sensitivity analysis referred to by AT&T that gives us great confidence in the robustness of the bottom line result. In the extremely unlikely event that the actual increase in labor costs is as high as 5% (extremely unlikely, because such a result would require that virtually all of the factors for which uncertainty exists[3] have been maximally understated)[4] then the total amount of unrecovered SFAS 106 costs is reduced by a mere 12% (from 84.8% to 74.7% as shown on page 41 of the Godwins study). Thus, there can be little doubt as to the solidity of the results, and the Commission can be quite confident that any uncertainty in the basic results of the actuarial analysis will not have a significant effect on the final result.

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3 See pp. 34-37 of the Godwins study.

4 In fact, great care was taken to be conservative in estimating those factors to ensure that the impact of SFAS 106 on GNP-PI was, if anything, overstated. See, for example, the following in the Godwins Report:

- Calculation of prefunding adjustment (page 19)
- Basic BLI methodology (page 34)
- Average retirement ages for non-LECs (page 35)
- Discussion of labor cost percentage adjustment (pages 36-37)

MCI Contention - (Page 25)

"In no place within the study is there an attempt to verify the costs of SFAS 106 to non-LEC firms."

"The 3.19% increase in labor costs to non-LEC firms providing OPEB does not square with other estimates of the SFAS 106 costs..... This amount is only 40% of the estimates by Warshawsky (in Postretirement Health Benefit Plans: Costs and Liabilities for Private Employers, No. 76 Finance and Economics Discussion series, Division of Research and Statistics, Division of Monetary Affairs, Federal Reserve Board, Washington, D.C., June 1989)."

Response -

MCI's contention is a gross misrepresentation of the facts. It is true that in the referenced article Warshawsky does estimate that, based on 1988 data, the aggregate increase in retiree medical expense due to the introduction of SFAS 106 would be much higher than the 3.19% estimated by Godwins. However, despite the fact that Warshawsky is a well trained economist and clearly undertook his research in a responsible manner, MCI has utilized the results of that research irresponsibly. Specifically, the following must be noted:

(1) Warshawsky himself now recognizes that his original estimate was unrealistically high, and he has significantly reduced this estimate in his most recent analysis.[5]

(2) Even Warshawsky's revised estimate is significantly higher than other aggregate estimates produced by the GAO[6] and EBRI[7] for the same time period. Despite this,

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5 "The Uncertain Promise of Retiree Health Benefits," the AEI Press, 1992.

6 General Accounting Office, Human Resources Division, "Employee Benefits: Companies' Retiree Health Liabilities Large, Advance Funding Costly," June 1989, GAO/HRD-89-51.

7 Employee Benefit Research Institute, "Issues and Trends in Retiree Health Insurance Benefits", Issue Brief No. 84, November 1988.

MCI selected Warshawsky's earlier estimate and chose to ignore both Warshawsky's revision and other lower estimates. These other estimates are quite consistent with the Godwins estimate, and are fully encompassed by the sensitivity analysis included in the Godwins Report.

(3) Warshawsky's revised estimate is itself too high because his assumptions regarding plan provisions, actuarial assumptions, and demographics were wrong. These erroneous assumptions are described in greater detail below.

(4) Estimates produced by Warshawsky, as well as the GAO and EBRI, are all based on 1988 plan provisions. The Godwins estimate is more accurate because it is based on 1990 plan provisions, which are more up-to-date.

Each of these points is discussed in greater detail below.

(1) Warshawsky now recognizes that his original estimate was wrong.

In the material referred to by MCI, Warshawsky estimated that aggregate SFAS 106 costs in 1988 dollars would have been $67.9 billion, while "pay-as-you-go" costs were $14.5 billion. This net increase in costs of $53.4 billion translates to approximately 6.82% of 1988 total compensation[8] for covered employees, and directly corresponds to the Godwins estimate of 3.19%.

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8 1988 Total Compensation for U.S. workers was $2921.3 billion as shown in the November, 1991 Survey of Current Business. Based on the GAO study, 26.8% of all workers are covered by plans subject to SFAS 106 (see page 21 of the Godwins Report). Therefore, according to Warshawsky, additional SFAS 106 costs are 53.4 ÷ (2921.3 X .268) = 6.82% of compensation.

Warshawsky now realizes that his earlier estimate was based on an erroneous demographic makeup of the total covered population (for example, the ratio of active employees to retirees used was 3.8 to 1, which is far lower than for the typical company[9]). In his recent book (The Uncertain Promise of Retiree Health Benefits, the AEI Press 1992), Warshawsky revises his estimate of aggregate 1988 SFAS 106 accrued liability and expense downward by 25% and 12%, respectively. In this new study, the aggregate estimate of SFAS 106 expense becomes $58.9 billion, while "pay-as-you-go" costs are reduced to $11.3 billion. Thus the net increase due to SFAS 106 of $47.6 billion now translates to an increase of 6.08% of compensation. As shown in item (3) below, even this estimate is unrealistically high, due to the incorrect assumptions that Warshawsky relies on.

(2) *Warshawsky's revised estimate is significantly higher than other estimates of aggregate SFAS 106 costs.*

Both the GAO and EBRI produced estimates of SFAS 106 liabilities, based on 1988 data, that can be directly compared to that produced by Warshawsky. Warshawsky's revised estimate of $332.1 billion is, in fact, 50% higher than the GAO estimate of $221.0 billion, and 34% higher than EBRI's estimate of $247.0 billion. While neither the GAO nor EBRI explicitly calculated the increase in aggregate annual expense as a result of SFAS 106, their liability estimates translate to increases of 4.05%[10] and 4.52%[11] of compensation, respectively. Both of these values are well within the range of values used in the sensitivity analysis performed by Godwins. Page 41 of the Godwins Report illustrates results assuming the aggregate increase in costs due to SFAS 106 range from 2% to 5% of total compensation of covered employees. Even at the very high value of 5% (high because this

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9 See page 47 of the Godwins Report.

10 221 + 332.1 x 6.08% = 4.05

11 247 + 332.1 x 6.08% = 4.52

value, in addition to being materially higher than both the GAO and EBRI estimates, would also require that virtually all the factors outlined on pages 34-37 of the Godwins Report to have been maximally underestimated), the percentage of TELCO's SFAS 106 costs that are not recovered, through the GNP-PI increase and wage rate reduction, is only reduced from 84.8% to 74.7%.

(3) *Warshawsky's revised estimate is too high due to incorrect assumptions.*

In carefully reviewing the methodology employed by Warshawsky, it becomes quite clear why he arrives at aggregate cost estimates that are so much higher than the GAO and the EBRI estimates, as well as the Godwins estimate. Simply put, the methodology employed by Warshawsky utilizes assumptions regarding plan provisions, the demographic profile of the covered population, and actuarial assumptions to be used by companies to calculate SFAS 106 expense, that are demonstrably wrong. Specifically, in estimating the SFAS 106 accrued liability, Warshawsky:

- Assumes a "reasonably generous health plan with low deductibles and co-payments" for all companies (Pg. 92). A multitude of surveys (see, for example, Health Care for Retired Employees by Betty Malroy Stagg, The Conference Board Research Bulletin No. 202, 1987) demonstrate that this is simply not the case. Many companies in fact provide quite a bit less than "reasonably generous" benefits.[12] In fact, using data not available to Warshawsky, the Godwins BLI methodology was developed to specifically isolate the variation of "generosity" among companies' retiree medical plans.

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12 See page 7 of the Conference Board report cited above and pages 9-11 of the Hewitt Associates 1990 Survey of Retiree Medical Benefits.

- Assumes lifetime coverage for both the retiree and his spouse, for all companies. This is clearly unrealistic, and contradicted by the Conference Board material referenced above.[13]

- Assumes all active employees become eligible for full benefits at age 55. This also is contradicted by the studies referred to above.[14]

- Assumes mortality at 83 GAM[15] rates while many companies continue to assume higher mortality rates.

- Utilizes a 1% spread between the discount rate and medical trend rate combined with a 4% per year aging factor.

- Assumes a retirement age of 62.5, in contrast with the evidence of average retirement ages between 63.5 and 64, as shown on page 35 of the Godwins Report.

Strong evidence that Warshawsky's actuarial assumptions as to trend and mortality result in unrealistically high SFAS 106 costs can be seen from the fact that the LECs used much lower cost assumptions to calculate their SFAS 106 costs. In fact, only 2 out of the 11 LECs on whom data was collected used the 83 GAM table for their SFAS 106 calculations, and the average spread between the discount rate and the ultimate trend rate for the LECs' SFAS 106 calculations is 2.57%. This is particularly compelling, given the fact that the respondents to the LECs' filings with the Commission have indicated that they believe that the assumptions used by the LECs overstate their SFAS 106 accruals.

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13 See pages 7-8 of the Conference Board report.

14 See page 9 of the Hewitt Associates study cited in footnote 12 on the previous page.

15 The 1983 GAM mortality table is the most modern (lowest death rates) currently used for pension valuations in the United States. While it was published by the Society of Actuaries in October, 1983, it still has not been universally adopted by enrolled actuaries for their pension valuations.

In addition to the problems cited above, Warshawsky also assumes that the demographic profile of the entire covered population is a "reasonably mature and stable group" which is "typical of many large companies." While Warshawsky does not disclose the specific age and service characteristics of this group, based on his statements we must assume that it is older and has longer service than the average covered group. (Note that the GAO survey[16] reports that a very significant number of retiree medical programs are sponsored by companies with less than 500 employees.) By utilizing a demographic profile of such age/service characteristics, Warshawsky is undoubtedly overstating aggregate costs still further.

(4) *All three estimates (Warshawsky, GAO and EBRI) are based on out-of-date data.*

After rejecting Warshawsky's estimate due to the serious problems noted above, there still remains the question of why the GAO and EBRI estimates are both slightly higher than the Godwins estimate of aggregate SFAS 106 costs. The simple explanation for this is that retiree medical plans have changed substantially, between the time the data was gathered for the three estimates noted above (1988), and the time period for which plan provision data was collected for the Godwins study (1990). In fact, according to the Hewitt Associates 1990 Survey of Retiree Medical Benefits, 70% of all surveyed companies changed their retiree medical plans in 1988 or 1989. Thus, the Godwins estimate must be regarded as more accurate because it uses more recent information.

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16 General Accounting Office, Employee Benefits, "Extent of Companies' Retiree Health Coverage," GAO/HRD-90-92, March 1990.

SECTION III

RESPONSE TO OBJECTIONS REGARDING MACROECONOMIC ANALYSIS

A. Methodology and Choice of Model

MCI and AT&T raise three questions about the choice of a macroeconomic model and its use in estimating the impact of SFAS 106 on GNP-PI.

MCI Contention - (Page 31)

"Such a model, in its final form, is nothing more than a somewhat advanced spreadsheet model. ... This cannot be viewed as an objective forecasting tool, but rather as a means to legitimize overly simplistic calculations."

Response -

By calling the Godwins model a "somewhat advanced spreadsheet model", MCI means that the model is used to perform "what if" exercises. But a "what if" exercise is exactly what is required to study the impact on GNP-PI of the introduction of SFAS 106. To calculate the differential impact of SFAS 106, we need to ask "what happens to the value of GNP-PI if SFAS 106 is introduced." Any economic model, even a large-scale commercial econometric forecasting model, would have to be put through a "what if" exercise to determine the impact of SFAS 106. The criticism of the Godwins model for being used to perform "what if" exercises is unwarranted.

MCI Contention - (Page 32)

"USTA contends that the model, while not being useful for forecasting macroeconomic activity, can somehow be used for forecasting the differences in macroeconomic activity depending on a shift in an exogenous variable (the multiplicative term used to adjust labor costs for the SFAS-106 impacts.)" [footnote not repeated here] This distinction is artificial--if a model cannot be relied upon to forecast the interactions within the economy, how can it be utilized to predict the differences due to some alteration to one value within the model?"

Response -

To appreciate the distinction that MCI asserts is artificial, consider a simple example from outside the realm of regulation or economics. Suppose you are planning to take a 500-mile trip by car and you are concerned about how long the drive will take. The length of time will depend on the weather, road constructions along the way, traffic, accidents along the way, whether your car has mechanical trouble, and so on. Owing to the various unpredictable factors, any forecast of the duration of the trip may well be in error by an hour or more.

Now suppose that in planning your trip you want to know how much driving time you can save by packing lunch to eat while driving. If lunch at a fast food restaurant takes about half an hour, you estimate that packing lunch saves about half an hour. This informed guess can be made without having to (1) predict the overall duration of a trip that includes stopping for lunch; and (2) predict the overall duration of a trip that does not include stopping for lunch. You can avoid all of the complicating factors involved in trying to predict the overall duration of the trip. The prediction of the effect on duration of stopping for lunch may not be exactly right. (Indeed if you pack lunch rather than stop for lunch, you will never know if your prediction was right.) However, the forecast error of the effect of stopping for lunch is likely to be much smaller than the forecast error for the overall duration of the trip.

This example illustrates that when estimating the effect on a variable caused by a particular event, it is not necessary to forecast the actual value of that variable. The Godwins model calculates the effect of SFAS 106 on GNP-PI without having to forecast the actual level of GNP-PI.

AT&T Contention - (Page 10)

"Second, Godwins offers no methodology to test the validity of the macroeconomic model's results...If the model parameters and equations do not adequately describe real world data, then any predictions it gives are of little value."

Response -

These comments raise two separate questions: (1) do the model's parameters and equations adequately describe real world data? and (2) how can one test the validity of the model's results about the impact of the introduction of SFAS 106? In answer to the first question, the model's key parameters do describe real world data. The inputs to the model consist of 6 numerical parameters. Two parameters measure the share of labor cost in total cost, and the baseline values of these parameters were chosen to match the actual share of labor cost in total cost in the United States. One parameter measures the share of private sector employment covered by SFAS 106 benefits, and the value of this parameter was chosen to reflect the fact that of the 95.8 million private sector employees, 30.7 million are eligible to have a portion of their medical costs in retirement met by their employer's medical plan, subject to SFAS 106. A fourth parameter measures the percentage by which SFAS 106 directly increases the labor costs of employers that offer post-retirement medical benefits. The baseline value for this parameter was based on the extensive actuarial study in the Godwins Report. A fifth parameter is the wage elasticity of labor supply, and as discussed on page 30 of the Godwins Report, the value of this elasticity was based on a published summary, by Mark R. Killingsworth, of the extensive econometric literature on the elasticity of labor supply. A sixth parameter, the price elasticity of demand, was not based directly on a specific set of data or a specific set of econometric studies. However, econometric studies of demand for various goods tend to find price elasticities on the order

of one, or smaller. (For example, on page 16 of its report submitted in opposition to the direct cases, ETI cites a price elasticity of demand of 0.723 for interstate switched access, in a study by J. Gatto et. al. of AT&T.) Experimentation with the model revealed that (1) the results of the model are not very sensitive to the price elasticity of demand; and (2) higher values of the price elasticity of demand tend to increase the calculated impact of SFAS 106 on GNP-PI. To guard against understating the impact on GNP-PI of the introduction of SFAS 106, it was decided to use a value for this parameter that likely overstates the true value, so a value of 1.5 was used in the baseline case, as explained on page 29 of the Godwins Report.

The second question, which concerns testing the model's results about the impact of SFAS 106, is a conceptual question that would confront <u>any</u> model, not just the Godwins model, used to estimate the impact of SFAS 106 on GNP-PI. As AT&T points out on page 10, "there is no way to independently verify by observation the true change in GNP-PI due to SFAS 106 even after SFAS 106 goes into effect." This quoted sentence is correct, but notice that this sentence is independent of the choice of a model. As explained in the May, 1992 Godwins Response to Paragraph 16 of the FCC Order of Investigation and Suspension (p. 7), it is impossible to directly observe the impact of SFAS 106 on GNP-PI, even after the fact, because we have no way to directly observe what GNP-PI *would have been* in the absence of SFAS 106. This problem is faced by predicted changes based on econometric models as well as changes based on quantitative classical general equilibrium models, such as the one used in the Godwins Report.

AT&T (p. 10) goes on to point out that "standard economic practice is to perform tests whenever a model is based on estimates to see how closely the model mirrors actual data." For example, large-scale commercial econometric forecasting models are designed to forecast the values of various macroeconomic variables. Then the actual values of these variables are compared to the values forecasted by the model, and the difference between the actual and forecasted values is called the forecast error. Statistical properties of forecast errors, such as the root mean square error or the mean absolute forecast error, are then calculated. Although this statistical analysis of forecasts is commonly applied to large-scale econometric models, one should not be misled into thinking that these analyses can test the validity of a model's prediction about a change in a macroeconomic variable (such as GNP-PI), when some aspect of the model is changed (such as the introduction of SFAS 106). Statistical properties of forecast errors can be used to test the accuracy of <u>conditional</u> forecasts[17], but do not address the question of the model's accuracy when predicting the effects of a change in the model's inputs.

We are faced with a choice between a quantitative classical general equilibrium model of the sort used in the Godwins Report and a large-scale commercial econometric forecasting model. Neither type of model has been tested for the validity of the predicted macroeconomic effects resulting from the introduction of SFAS 106. Both types of models

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17 Conditional forecasts use assumed future values of various inputs to the model, and thus are "conditional" on these assumed future values.

"fit" their key parameters to real world data: quantitative classical general equilibrium models base their parameters on independent econometric studies and/or calibration of certain parameters to make the values of certain variables match actual data; econometric models estimate the values of their parameters econometrically.

Which type of model should we use? The Godwins Report lists five desirable criteria for a model to be used to study the impact of SFAS 106 on GNP-PI. The quantitative classical general equilibrium model in the Godwins Report satisfies all five of these criteria, but as explained in the May, 1992 Godwins Response to Paragraph 16 of the FCC Order of Investigation and Suspension, large-scale commercial econometric forecasting models fail to satisfy at least two of these criteria.

B. Sensitivity

AT&T raised three questions about the sensitivity of the results.

AT&T Contention - (Page 10)

"Third, the validity of the macroeconomic model is further called into question because of the great sensitivity it exhibits to changes in assumptions. For example, altering the baseline assumption of labor elasticity from zero to an elasticity of 0.1 increases the impact on GNP-PI by more than 400% (a 0.0642% impact vs. the 0.0124% base case impact.)"

Response -

In judging whether the difference between 0.0124% and 0.0642% is large, it is important to look at the magnitudes involved. Both of these numbers are a tiny fraction of 1 percent. True, the larger of these two numbers is 5 times as large as the smaller number, but both of these numbers are essentially zero, and five times zero is still zero. To see that there is no essential difference, suppose that in the absence of SFAS 106, GNP-PI would have a value of 125.0. A 0.0124% increase would result in a GNP-PI of 125.0155, whereas a 0.0642% increase would result in a GNP-PI of 125.0802. GNP-PI is only reported to one decimal place, so the alleged "great sensitivity" amounts to the difference between 125.0 and 125.1 for GNP-PI. Rather than looking unstable, the results appear remarkably robust to this change in parameter value.

Instead of focusing on the sensitivity of the GNP-PI effect, one might want to focus on the percentage of additional SFAS 106 costs "to be met from other sources" reported in columns headed (c) in the sensitivity analysis on page 41 of the Godwins Report. This number is the "bottom line" number. As shown on page 41, in the baseline case, the portion of additional SFAS 106 costs to be met from other sources is 84.8%; increasing the labor supply

elasticity to 0.1 reduces this number to 84.1%. Again, the results are remarkably robust.

AT&T Contention - (Page 11) "Moreover, Godwins' analysis looks at changes in parameter values on a 'one at a time' basis (p. 38)."

Response - Section IV of the Godwins Report is devoted entirely to sensitivity analysis, and it presents two tables of results (page 39 and page 41). The table on page 39 focuses only on the sensitivity of GNP-PI to changes in parameter values, and examines these changes in parameter values one at a time. However, the table on page 41, which summarizes the sensitivity analysis for the overall results, does not look at parameter changes one at a time.

Why does the table on page 39 focus on changes in parameter values one a time? It was recognized at the outset that there are 648 possible combinations of parameter values.[18] Rather than grind through all of these combinations, it was decided to first examine the effects of changes in parameter values one at a time to learn which parameters have the largest impact on GNP-PI. As shown on page 39, the direct impact on labor costs in sector 2 and the labor supply elasticity are the two parameters for which GNP-PI exhibits the most sensitivity. Then, having learned that GNP-PI exhibits the greatest sensitivity to these two parameters, the sensitivity analysis for the overall results on page 41 examines all combinations of these two parameters.

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18 Including the baseline values, the Godwins Report examined:
2 values of the price elasticity of demand;
3 values of labor share in total cost, sector 1;
3 values of labor share in total cost, sector 2;
3 values of fraction of labor employed in sector 2;
3 values of direct impact on labor costs in sector 2;
4 values of labor supply elasticity
Thus, there are 2 x 3 x 3 x 3 x 3 x 4 = 648 combinations of parameter values.

It still does not seem to be worthwhile to grind through all 648 combinations, but, in response to AT&T's comment, additional sensitivity analysis was performed to explore parameter values that lead to low values of the percentage of additional SFAS 106 costs to be met from other sources (which is 84.8% in the baseline case). The additional sensitivity analysis was performed as follows: Four of the parameters were each set at the value that led to the largest increase in GNP-PI when the parameters were varied one at a time. (Price elasticity of demand = 3.0; share of labor costs in total cost, sector 1 = 0.78; share of labor costs in total cost, sector 2 = 0.78; initial fraction of labor employed in sector 2 = 0.4.) While these four parameters were set at values that individually contributed to the largest impact on GNP-PI, each of the four values of the labor supply elasticity was examined in combination with each of the three values of the direct impact on labor costs in sector 2. The results of this additional sensitivity analysis are reported in Appendix C. Notice that the lowest value obtained for the percentage of additional SFAS 106 costs to be met from other sources is 60.1%. This number was obtained by combining unlikely and extreme values of all 6 parameters. The chance that all 6 of these parameters simultaneously take on such extreme values is essentially negligible. Whereas the finding in the Godwins Report that 84.8% of additional SFAS 106 costs need to be met from other sources should be regarded as a conservative estimate, the 60.1% figure should be regarded as an unrealistically low underestimate of the amount requiring recovery from other sources.

AT&T Contention - (Pages 12-13)

"Because the SFAS 106 accrual is inherently imprecise and measurement of its impact on the economy is extremely difficult to assess, it is not possible to predict the full extent that SFAS 106 will affect prices in the economy generally (as both Godwins and NERA attempt to do).*" [footnote omitted]

Response - The Godwins Report explicitly recognizes that there are uncertainties associated with the calculation of the effects of the introduction of SFAS 106, and deals with these uncertainties in two ways: (1) whenever a decision needs to be made about the numerical value of some data or parameter, the Godwins Report always attempts to err on the side of overstating the impact on GNP-PI of the introduction of SFAS 106. In the macroeconomic analysis, this conservative approach is represented by the choice of baseline values of the price elasticity of demand and the labor supply elasticity that are likely to be higher than the true values of these parameters, as explained on pages 29 and 30, respectively, of the Godwins Report. (In the actuarial analysis, this same conservative approach is noted in footnote 4 on page 16 of this Report.) This conservative approach lends additional support to the finding that SFAS 106 will have a tiny effect on GNP-PI, because even the small effect predicted by Godwins is probably an overstatement of the true effect. (2) Recognizing the uncertainty associated with the data and parameters, Godwins devoted an entire section of its report (Section IV) to sensitivity analysis. Again, the sensitivity analysis lends additional support to the conclusion that the introduction of SFAS 106 has only a tiny effect on GNP-PI.

C. Details of Specification of the Macroeconomic Model

MCI raised three questions concerning the detailed specification of the model.

MCI Contention - (Page 32) MCI asserts that the USTA model assumes among other things "perfect substitutability of capital and labor."

Response - This assertion is plain wrong. The most common measure of the substitutability of capital and labor is the elasticity of substitution between capital and labor. "Perfect substitutability" describes the situation in which the value of this elasticity of substitution is infinite. In the USTA model, the value of this elasticity of substitution is equal to one, rather than infinity, as implied by MCI's assertion.

MCI Contention - (Page 33) MCI states (correctly) that the model "has no international sector."

Response - Every economic model is a simplification of reality. As a practical matter, a usable model must ignore many aspects of reality. The skill in building a good model rests in including those aspects of reality that are quantitatively important for the issues being studied, and in ignoring those aspects of reality that are less quantitatively important for the issues being studied. Despite all the attention that international trade and foreign competition receive in the press, it must be remembered that international trade is a small part of U.S. GNP. In 1991, net exports were equal to 0.5% of GNP in the U.S. (net exports were negative, so it is the magnitude, or absolute value, of net exports that was 0.5% of GNP). Even looking at gross trade flows rather than the net flow, imports accounted for only 10.9% of GNP, and exports accounted for

only 10.4% of GNP in 1991. Thus, the inclusion of an international sector did not seem important to study the impact of SFAS 106, and there is nothing convincing in the MCI statement that would lead to revising this judgment.

MCI Contention - (Page 33) "Finally, although the model is attempting to review a dynamic phenomenon, the structure of the model is static in form."

Response - Rather than being a weakness, the static nature of the model is a virtue. There is quite a bit of disagreement among macroeconomists about the short-run dynamic behavior of the macroeconomy, and indeed economists seem to have a lot of trouble predicting short-run dynamic behavior, such as turning points in the business cycle. Because the prediction of short-run macroeconomic behavior is so difficult, it was decided to avoid this task, and instead to analyze the ultimate effects of SFAS 106 when the economy reaches a new equilibrium. A static model, which simply avoids difficult short-run dynamics, is appropriate for analyzing the ultimate effects of the introduction of SFAS 106. As stated in the Godwins Report (p. 26), "The model is best viewed as a long-run model that fully incorporates the effects of SFAS 106." An additional advantage of focusing on the "long-run" or full effect of SFAS 106 is that it probably overstates the short-run impact on GNP-PI of the introduction of SFAS 106 because, owing to various lags in the economy's adjustment process, short-run effects are generally smaller than long-run effects. This likely overstatement of the impact of SFAS 106 is consistent with the conservative approach of the Godwins Report, which is to guard against understating the impact on GNP-PI of SFAS 106.

D. Response to Comments of Independent Macroeconomist on the Model and its Results

The statement below represents the entire commentary on the macroeconomic model by an independent economist engaged by MCI.

MCI (Drazen) - (Pages 8-9)

"The USTA study also presents a macroeconomic model to estimate the effect of SFAS 106 on the GNP Price Index (GNP-PI) to see what fraction of costs will be recovered via the increase in GNP-PI. The macroeconomic model is theoretically correct, but a very highly simplified and abstract model of the U.S. economy. For example, there are assumed to be only two aggregate factors of production, total capital and total labor, and the whole economy is assumed to be perfectly competitive. Hence, the true effect of SFAS 106 on the GNP-PI may be significantly different (in a statistical sense, though probably not in order of magnitude) than the figure of 0.0124% that is presented. The true effect on the average wage rate in the economy may also be very different than what the very simple macroeconomic model predicts, both in terms of statistical significance and in terms of order of magnitude."

Response -

This statement is clearly and carefully written by Allan Drazen, a well-respected economist. The remarks below are presented to help non-economists interpret some of the economic jargon used by Drazen.

Drazen's assertion that the "macroeconomic model is theoretically correct" should be regarded as praise, since this judgment comes from a macroeconomist who has published many of his own theoretical models. To an economist, the statement that the model is theoretically correct indicates that the basic economics underlying the model is sound, and that the mathematical formulation of the model is an appropriate formalization of the economics.

Although Drazen certifies the model as theoretically correct, he points out that it is "very highly simplified and abstract." Whether "very highly simplified and

abstract" is a virtue or a vice depends on the benefits and drawbacks associated with simplification and abstraction. In this case, simplification and abstraction has the benefit of allowing the model to be a tractable representation of the important economic phenomena associated with an increase in labor costs, such as that associated with the introduction of SFAS 106. In addition to promoting tractability, the simplification avoids the possibility that irrelevant complications somehow contaminate the model's results.

Drazen's statement focuses on the drawbacks of simplification and abstraction in this case. As will be explained below, a careful reading of Drazen's statement indicates that he thinks that, despite the simplification and abstraction, the Godwins model produced essentially the right answer for the effect on GNP-PI, but he has some doubt about the effect on the wage rate.

The key to understanding Drazen's statement lies in the parenthetical statement in the quote "may be significantly different (in a statistical sense, though probably not in order of magnitude)". Economists often distinguish between two concepts of significance: statistical significance vs. economic significance. For instance, the true effect of something is said to be statistically significantly different from the estimated effect if econometric and/or statistical analyses indicate that we can have a high degree of confidence (usually 95% confidence) that the true effect is different from the estimated effect. It is possible that the estimated effect is very close to the true effect, and yet statistical and/or econometric methods may detect a statistically significant difference; in this case, economists would describe the difference as

statistically significant, but not economically significant.

Drazen's statement indicates that the true effect of SFAS 106 on GNP-PI may be statistically significantly different -- but not economically significantly different -- from the effect estimated by the Godwins model. He states that the true effect on GNP-PI is probably not different, in order of magnitude, from the 0.0124% effect estimated by Godwins. That is, the order of magnitude of the Godwins estimate is tiny, and Drazen does not dispute the finding of a tiny effect on GNP-PI.

The calculated effect of SFAS 106 on the wage rate is almost two orders of magnitude larger than the calculated effect on GNP-PI, and Drazen suggests that the true effect on the wage rate may differ from the calculated effect, both in terms of statistical significance, and in terms of order of magnitude. However, he does not indicate whether the effect calculated by Godwins is likely to be too large or too small.

To summarize, Drazen's remarks about the macroeconomic results of the Godwins Report serve as much to bolster the results as to challenge them. Drazen pronounces the macroeconomic model to be theoretically correct and he notes, but does not challenge, the finding of a tiny impact on GNP-PI. Finally, he does not indicate whether his doubts about the effects on the wage rate would lead him to expect a larger or a smaller effect than is found in the Godwins Report.

E. Response to Ad Hoc Users

The criticisms of the macroeconomic analysis in the Godwins Report presented in The Opposition of the Ad Hoc Telecommunications Users Committee to Direct Cases is simply a summary of criticisms made in a report prepared by Economics and Technology, Inc. (ETI) for the International Communications Association. To avoid repetition, we will not separately respond to the Opposition of the Ad Hoc Telecommunications Users Committee report, and to the ETI report. Instead, we will respond only to the ETI report. Responding to the ETI report presents a special challenge. Unlike the oppositions filed by AT&T, MCI, and the remainder of the Ad Hoc Users filing, the report submitted by ETI is unprofessional in both its tone and its substance. When reading the assertions that appear instead of reasoned economic analysis, one wonders why ETI chose to write the report this way. Was it the result of an inability to understand the economic analysis in the Godwins Report, or was it the result of a deliberate attempt to misrepresent and distort the report? Regardless of the reason, ETI's reckless assertions have been entered into the record, so it is necessary to set them straight.

ETI asserts on page 13 of its report that the Godwins Report contains at least six fatal flaws. The first alleged fatal flaw deals with the role of calibration, and the remaining five alleged fatal flaws are numbered 1 - 5 on page 15 of the ETI report.

ETI Contention - (Page 14)

"In the Godwins model, the key numbers which determine the results are simply invented. They are made up. ... A quote from Appendix C-5 of the Godwins Report illustrates the process:

> The model is *calibrated* so that in the absence of FAS-106 it yields an allocation of labor across sectors...It is also *calibrated* such that in the absence of FAS-106, all nominal prices are equal to one." [emphasis added by ETI]

Response - Several comments are in order. First, let's look at what ETI omitted from the quoted passage from the Godwins Report where the ellipsis appears after "labor across sectors." The following words were left out: "that matches the actual allocation of labor across sectors." [emphasis added] Now why were these nine words omitted by ETI? Certainly not because they took up too much extra space. And certainly not because these nine words were not germane to the point ETI was trying to make. Quite the contrary--these nine words indicate that the numbers were not made up or invented; the numerical values of the parameters were chosen so that the share of workers eligible for SFAS 106 benefits in the model would equal the actual share in the U.S. economy. That is, these nine words prove the opposite of ETI's assertion, and ETI simply chose to suppress them.

Second, the passage quoted from the Godwins Report states that in the initial equilibrium, before the introduction of SFAS 106, all nominal prices are set equal to one. It seems that the authors of the ETI report regard this as an invented number. However, there is a difference between a price index and the price of a specific good measured in local currency. GNP-PI is a price index, and like all indexes, a single specific numerical value of the index is meaningless, unless the scale or base is specified. The value of an index in a base year is entirely arbitrary, and to make the interpretation of the numbers simple, the price indexes were normalized so that the price index in the initial situation had a value of one. The concept of normalization should be familiar to anyone with graduate training in economics, and there is no meaningful sense in which normalization should be interpreted as "inventing numbers."

Third, ETI italicizes the word "calibrated" twice in the quoted passage, as if to emphasize that "calibrated" means "invented" or "made up." The problem is that the authors of the ETI report do not appear to know what calibration is. They ask the question on page 14: "What is this calibration?" Then they assert that calibration does not involve real economic data, and they cite as proof the fact that the term calibration is not used in standard econometrics textbooks. The problem is that the authors looked in the wrong place to find out about calibration. The right place to look is in the macroeconomics literature, in particular the burgeoning literature on quantitative general equilibrium macroeconomic models. An influential paper that uses calibration and is already becoming a classic in this literature is Edward C. Prescott's "Theory Ahead of Business Cycle Measurement," Quarterly Review, Federal Reserve Bank of Minneapolis, Fall 1986, pp. 9-22. Calibration is at the frontier of quantitative macroeconomics and has not yet filtered into many undergraduate textbooks. However, calibration is described in Chapter 11 of Macroeconomics by Andrew B. Abel and Ben S. Bernanke, Addison-Wesley Publishing Co., 1992, a book co-authored by one of the authors of the Godwins Report and used at dozens of leading colleges and universities.

Calibration is an alternative method to direct econometric estimation for choosing numerical values of parameters in a macroeconomic model. In calibrated models, numerical values may be based on econometric estimation of microeconomic data and/or they may be chosen so that variables in the model match actual values of real economic data. Both of these techniques were used in the model in the Godwins Report. For instance, the parameters of the

production functions were calibrated so that the share of labor cost in total cost matched the actual share of labor in total cost in the U.S. economy. Contrary to the assertion in the first paragraph on page 14 of the ETI report ["Another key factor, the labor supply elasticity, the response of labor supplied to real wage changes, is assumed to be 0.00, again a number simply invented for the purposes of their report."], the value of the labor supply elasticity was based on a multitude of econometric studies. The first complete paragraph on page 30 of the Godwins Report discusses the summary by Mark R. Killingsworth of the extensive econometric literature on the elasticity of labor supply. Each of the many studies finds different numerical values for this elasticity, and it seems pointless to try to pick one of the estimates in one of the studies. It is even more pointless to econometrically estimate this elasticity independently, given the multitude of existing estimates. The sensible approach is to observe that the estimates tend to show a small, even slightly negative, elasticity. Because the impact of SFAS 106 on the GNP-PI is larger for higher labor supply elasticities, a value of 0.0 was chosen so as not to understate the impact on GNP-PI. Furthermore, the sensitivity analysis explored the effect of even higher values of this elasticity.

It should be acknowledged that the value of one parameter, the price elasticity of demand, was not directly calibrated from a specific set of data or a specific set of econometric studies. The value of this parameter was chosen by observing that econometric studies of the demands for various goods tend to find price elasticities of demand on the order of one, or smaller. For instance, the ETI report on page 16 cites a price elasticity of demand of

[redacted]

J. Gatto, et. al. of AT&T. Because price elasticities of demand tend to be smaller for broader categories of goods, the price elasticities of demand for sectors 1 and 2 in the Godwins model (which account for about 2/3 and 1/3 of private sector output, respectively) are most likely smaller than one. The baseline calculation used an elasticity of 1.5 because experimentation with the model indicated that the effect of SFAS 106 on GNP-PI is (1) not very sensitive to the price elasticity of demand, and (2) higher for higher values of the price elasticity of demand. Therefore, to provide a cushion against understating the effects on GNP-PI, the value of the price elasticity of demand was purposely set higher than the likely true value of this elasticity.

The ETI report complains that only "after much evasion" (p. 14) did the May, 1992 Godwins Response to Paragraph 16 of the FCC Order of Investigation and Suspension admit that its model is not econometrically estimated. The first paragraph of the May Response states that the original Godwins Report contained enough information so that a well-trained professional economist could reproduce the numerical results of the macroeconomic model. The second paragraph begins by pointing out that it would be helpful to contrast the model in the Godwins Report with conventional large-scale short-run econometric forecasting models. This is clearly not evasive.

Having addressed the ETI report's misrepresentation of calibration, we now discuss the five numbered alleged flaws.

ETI Contention - (Page 16)

"Godwins choose (sic) the wrong kind of model to evaluate the effects of FAS 106."

Response -

According to ETI, a large-scale commercial econometric model would have been preferable to a classical general equilibrium model for the purpose of analyzing the impact of SFAS 106. The May, 1992 Godwins Response to Paragraph 16 of the FCC Order of Investigation and Suspension has already addressed in detail the choice of a classical general equilibrium model rather than a large-scale commercial econometric forecasting model. ETI has already complained on page 14 that that response contained "duplication of material from the February report" so that discussion will not be repeated here. It should be noted, however, that the Godwins Report listed five desirable criteria for a model to use in addressing the impact of SFAS 106. The classical general equilibrium model used in the Godwins Report meets all five of these criteria, but as pointed out in the Godwins Response to Paragraph 16, large-scale commercial econometric forecasting models fail to meet at least two of these criteria.

ETI's discussion on pages 16-18 adds nothing of substance to the issue of choosing an appropriate type of model. The distinction drawn on page 16 between mathematical models and models explicitly designed to be estimated with actual data again reveals the authors' ignorance of the burgeoning macroeconomic literature on quantitative general equilibrium models. (See especially the sentence on page 16: "They are designed and studied to investigate a concept qualitatively *not quantitatively*." [italics in original]). The authors waste a few paragraphs on pages 17 and 18 deriding the monopolistic competition in the Blanchard-Kiyotaki model. Apparently they have failed to realize that monopolistic competition is one aspect of the

Blanchard-Kiyotaki model that is not present in the adaptation of this model used in the Godwins Report.

ETI Contention - (Page 18) "The key numerical parameters of the model are invented by Godwins and not estimated from any economic database."

Response - There is nothing new in this false assertion that has not already been addressed in this Supplemental Report. All of this material in this false assertion is a repetition based on the ignorance of calibration by the authors of the ETI Report.

ETI Contention - (Page 19) "The Godwins model erroneously assumes that workers do not evaluate the value from post-retirement benefits and that employers do not view these benefits as current costs."

Response - Page 19 of the ETI report states "The fundamental Godwins assumption is that employers who pay these post-retirement benefits do not now consider them labor costs." This quoted sentence presumably means that the Godwins Report assumes that, in the absence of SFAS 106, employers do not recognize post-retirement benefits as current costs. The reason for this assumption is that the Godwins Report attempted to take a conservative approach wherever possible. In this particular context, conservative means guarding against understating the impact of SFAS 106 on GNP-PI. Equivalently, the approach was to err on the side of overstating the impact on GNP-PI. Now if one argues that in the absence of SFAS 106 employers and employees fully recognize post-retirement benefits, then the introduction of SFAS 106 would have no effect on any prices, and the GNP-PI would be unaffected. Thus, GNP-PI would provide absolutely no recovery to Price Cap LECs who would then be entitled to seek 100% recovery of the increase in costs due to SFAS 106 because Price Cap LECs have not been able to recover these costs in the past.

However, to the extent that SFAS 106 formalizes and focuses attention on future post-retirement liabilities, and to the extent that firms carry larger liabilities on their balance sheets and thus face higher costs of borrowing, the introduction of SFAS 106 will lead to an increase in recognized current costs. How large is the increase in costs? As explained above, the conservative approach dictates that we overstate the effect of SFAS 106 on GNP-PI, so for macroeconomic purposes we treat all of the additional SFAS 106 expense as a cost.

ETI Contention - (Page 20)

"Next, the Godwins model incorrectly uses an outdated functional form to represent the production function for the economy."

Response -

Although the Cobb-Douglas production function was first used more than 60 years ago, it is still widely used in quantitative economic analysis, and one of its major predictions -- that factor shares are constant over time -- seems to hold up well in U.S. data. It is true that during the 1970s there was a flurry of activity to generalize the Cobb-Douglas production function, and this flurry included estimation of the translog production function cited in footnote 48 of the ETI report. The translog production function is considerably more general than the Cobb-Douglas production function, but this added generality comes at a cost. The translog production function has many more parameters to estimate or calibrate, and the quality of aggregate data on inputs may be sufficiently poor to make estimates of these additional parameters unreliable. It is worth noting that when these additional parameters are equal to zero, the translog production function becomes a Cobb-Douglas production function. In practice, estimates of many of these additional parameters have large standard errors and are not significantly different from zero at

standard confidence levels (see Ernst R. Berndt, The Practice of Econometrics: Classic and Contemporary, Reading Massachusetts: Addison-Wesley Publishing Co., 1990, Table 9.2 p. 473). In addition, the estimated elasticity of substitution between capital and labor, in a four-factor translog production function presented by Berndt on p. 475, is 0.97, which is very close to the elasticity of substitution of 1.0 that is characteristic of the Cobb-Douglas production function.

The ETI report closes its criticism of the use of the Cobb-Douglas production function on page 21 with the sentence, "Although it is not clear how significant the bias is from the use of the Cobb-Douglas model, it is clear that the analysis involves simplified assumptions dating back over 60 years." It is worth noting that not only does the ETI report admit that the significance of the bias is unclear, it does not speculate on the direction of any bias. The only thing that is clear to the authors of the ETI report is that the Cobb-Douglas production function is over 60 years old. Interestingly enough, the source cited in the ETI report states that the translog production function introduced in 1970 is "identical to the production function considered by Heady several decades earlier." (Berndt, p. 458)

Perhaps the best response to the criticism raised by the ETI report is contained in a 1988 book by Zvi Griliches (former Chairman of the Department of Economics at Harvard University, 1984 Vice President of the American Economic Association, 1965 winner of the John Bates Clark Medal for the best economist under the age of 40, and Fellow of the Econometric Society whose distinguished career has been devoted to the study of productivity): "There is also the issue of functional form for the estimated production

functions and the associated productivity computations. I could never take this range of issues seriously." (Zvi Griliches, Technology, Education, and Productivity, New York: Basil Blackwell Inc., 1988, pp. 306-307.)

KTI Contention - (Page 21) "Finally, the Godwins Report ignores the usual uncertainty that is associated with survey results measured by calculated standard errors."

Response - This criticism applies to the actuarial analysis and has been addressed on pp. 10-11 of this Supplemental Report.

F. Response to Miscellaneous Comment by MCI

MCI Contention - (Page 6, and FN 8)

"If exogenous treatment is afforded to one portion of the compensation package, an asymmetrical relationship will be afforded carriers under price caps. This will allow carriers to offer increased OPEB, for which they would receive exogenous treatment, and decrease other forms of compensation.[8] (footnote 8: In fact, the USTA study itself predicts a similar situation where SFAS-106 costs increase, the wage rate in the economy will fall, offsetting the increase in labor costs associated with SFAS-106.)"

Response -

Here it is appropriate to comment only on footnote 8.

In the Godwins Report prepared for USTA, the introduction of SFAS 106 leads to a reduction in the wage rate, relative to the wage rate that would have prevailed in the absence of SFAS 106. The fall in the wage rate is not a consequence of "an asymmetrical relationship [that] will be afforded carriers under price caps." The wage rate falls for all firms in the economy, even those firms that do not offer OPEBs covered by SFAS 106. The predicted nationwide fall in the wage rate is a market equilibrium phenomenon reflecting the nationwide fall in the demand for labor at any given wage rate, as explained on page 24 of the Godwins Report. Because the fall in the wage rate is an equilibrium phenomenon, it is beyond the control of any single firm or small group of firms.

Appendix A

Calculation of "Standard Error" of Average BLI
(Description of Methodology)

In response to a contention raised by the Ad Hoc Telecommunications Users Committee, we have provided an analysis which was performed to determine whether "the uncertainty that is associated with survey results" could have materially affected the results outlined in the Godwins Report. The methodology employed in that analysis is described below.

The Godwins BLI database is extensive (830 plans in all) and holds data on Plans for 18 million participants out of a universe of 38 million participants. Statistical sampling error should have been minor. Godwins tested this hypothesis by calculating standard errors for the pre-65 and post-65 average BLI's. The analysis took account of the six industry groups used in the USTA Report, the BLI weightings within each industry group, the weightings of the industry-group BLI's in developing the final averages, and of the finite universe effect whereby dispersion tends to zero when a sample enlarges to exhaust the universe.

For each industry group (i=1, i=2, ... i=6) a variance was calculated for the set of BLI_j's (j=1, N_i) observed for the group, N_i being the number of Plans in the Godwins database for industry group i. Weighted means were used in the USTA study, and the variance for the weighted mean for industry group i was calculated as the variance of the observed BLI_j's times the sum of the squares of the weights based on participant counts in the plans included in the industry group. The Godwins database has information for substantial percentages of covered employees in each industry group. The total number of plans in each industry group, T_i, was taken as the number of plans in the Godwins database for the industry group, N_i, times the ratio of covered employment for the industry group in the economy (a GAO figure) to the covered employment included in the Godwins database for the industry group. A standard adjustment factor of $(T_i - N_i) / (T_i - 1)$ was applied to account for the "finite universe effect".

The estimate of the variance of the means was taken as the sum of the products of the square of the "GAO weights" times the estimates of the industry-group variances. The square root of the estimate is the measure of the dispersion of the means. Numerical results from the calculations are summarized on the chart attached hereto. We see that pre-65 and post-65 dispersions are minor when contrasted to their corresponding means.

Calculation of "Standard Error" of Average BLI's
(Results)

Industry Group number:	(1)	(2)	(3)	(4)	(5)	(6)	Total
Number of Plans in GODWINS' database:	446	6	78	31	222	47	830
Number of Employees covered by such Plans:	11,129,686	94,893	1,472,589	1,884,054	3,549,719	780,402	18,911,343
Number of covered employees in economy (GAO):	11,602,872	562,891	8,853,209	3,962,734	10,431,800	3,040,556	38,454,062
Pre Age 65							
Weighted mean BLI for group:	0.7232	0.7758	0.7974	0.4730	0.6721	0.5771	0.6898
Variance of BLI's in group:	0.049191	0.060456	0.041069	0.067315	0.040691	0.068032	
Variance of weighted mean for group:	0.000711	0.028462	0.002895	0.006361	0.000747	0.004062	
Variance adjusted for Finite Universe effect:	0.000029	0.024396	0.002419	0.003379	0.000494	0.003035	0.000227
					Dispersion of weighted mean:		0.015076
					Mean + 1 standard deviation:		0.7049
					Mean - 1 standard deviation:		0.6747
Post Age 65							
Weighted mean BLI for group:	0.2340	0.0604	0.2643	0.0603	0.1926	0.1267	0.2008
Variance of BLI's in group:	0.019851	0.022000	0.011883	0.011052	0.015966	0.018178	
Variance of weighted mean for group:	0.000287	0.010357	0.000838	0.001044	0.000293	0.001085	
Variance adjusted for Finite Universe effect:	0.000012	0.008878	0.000700	0.000555	0.000555	0.000811	0.000065
					Dispersion of weighted mean:		0.008080
					Mean + 1 standard deviation:		0.2089
					Mean - 1 standard deviation:		0.1927

Appendix B

Average Age / Average Service for Mature Populations

Promulgated from Varying Turnover and Retirement Assumptions

Average Age

Age of New Hires	T2 RA 62	T2 RA 63	T2 RA 64	T6 RA 62	T6 RA 63	T6 RA 64	T10 RA 62	T10 RA 63	T10 RA 64
25	39.94	40.35	40.76	36.96	37.24	37.53	31.02	31.09	31.16
26	40.75	41.16	41.58	37.88	38.18	38.48	32.16	32.23	32.31
27	41.54	41.96	42.38	38.80	39.11	39.42	33.29	33.38	33.47
28	42.32	42.74	43.17	39.71	40.02	40.34	34.43	34.53	34.63
29	43.08	43.51	43.94	40.60	40.93	41.26	35.56	35.68	35.79
30	43.83	44.27	44.70	41.48	41.81	42.16	36.70	36.82	36.95
31	44.57	45.01	45.45	42.34	42.69	43.04	37.82	37.96	38.11
32	45.29	45.74	46.18	43.19	43.55	43.91	38.94	39.10	39.26
33	46.00	46.45	46.90	44.02	44.39	44.77	40.05	40.22	40.40
34	46.69	47.14	47.60	44.84	45.22	45.60	41.14	41.34	41.53
35	47.36	47.82	48.28	45.64	46.03	46.43	42.22	42.43	42.64

Average Service

Age of New Hires	T2 RA 62	T2 RA 63	T2 RA 64	T6 RA 62	T6 RA 63	T6 RA 64	T10 RA 62	T10 RA 63	T10 RA 64
25	14.94	15.35	15.76	11.96	12.24	12.53	6.02	6.09	6.16
26	14.75	15.16	15.58	11.88	12.18	12.48	6.16	6.23	6.31
27	14.54	14.96	15.38	11.80	12.11	12.42	6.29	6.38	6.47
28	14.32	14.74	15.17	11.71	12.02	12.34	6.43	6.53	6.63
29	14.08	14.51	14.94	11.60	11.93	12.26	6.56	6.68	6.79
30	13.83	14.27	14.70	11.48	11.81	12.16	6.70	6.82	6.95
31	13.57	14.01	14.45	11.34	11.69	12.04	6.82	6.96	7.11
32	13.29	13.74	14.18	11.19	11.55	11.91	6.94	7.10	7.26
33	13.00	13.45	13.90	11.02	11.39	11.77	7.05	7.22	7.40
34	12.69	13.14	13.60	10.84	11.22	11.60	7.14	7.34	7.53
35	12.36	12.82	13.28	10.64	11.03	11.43	7.22	7.43	7.64

Appendix C

Additional Sensitivity Analysis

Extreme Parameter Values Leading to Low Estimates of the Percentage of Additional SFAS 106 Costs to be Met from Other Sources

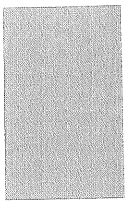
Additional SFAS 106 Costs of Average Employer with SFAS 106 Liabilities

Labor Supply Elasticity	|<----- 2% -----> (a)	(b)	(c)	|<----- 3% -----> (a)	(b)	(c)	|<----- 5% -----> (a)	(b)	(c)
0.0	0.9	12.0	87.1	2.0	17.5	80.5	5.4	27.5	67.1
0.1	3.9	10.0	86.1	6.4	14.6	79.0	12.5	22.8	64.7
0.2	6.7	8.1	85.2	10.6	11.8	77.6	19.4	18.3	62.3
0.3	9.4	6.4	84.2	14.6	9.1	76.3	26.0	13.9	60.1

(a) reflected in GNP-PI
(b) financed by potential reduction in the wage
(c) to be met from other sources

price elasticity of demand = 3.0
share of labor costs in total cost in sector 1 = 0.78
share of labor costs in total cost in sector 2 = 0.78
initial fraction of labor employed in sector 2 = 0.4

Attachment F - 1992 Godwins Additional Sensitivity Analysis



UNITED STATES TELEPHONE ASSOCIATION

Analysis of Impact of SFAS 106 Costs on GNP-PI

Supplemental Report:
Additional Sensitivity Analysis

GODWINS

March, 1993

UNITED STATES TELEPHONE ASSOCIATION

ANALYSIS OF IMPACT OF SFAS 106 COSTS ON GNP-PI

ADDITIONAL SENSITIVITY ANALYSIS

March 31, 1993

Godwins

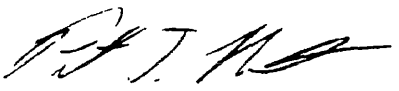
TABLE OF CONTENTS

BACKGROUND

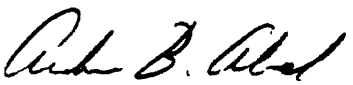
Over the last eighteen months Godwins has been working with the United States Telephone Association to analyze the impact of SFAS 106 costs on the GNP-PI and, in particular, to determine what portion of the increase in costs experienced by the Price Cap LECs due to SFAS 106 will, in fact, not be reflected in the GNP-PI or any other macroeconomic effect.

In February, 1992 we issued the results of our analysis, indicating that approximately 85% of the LECs' additional costs would not be reflected in the GNP-PI or recovered through other macroeconomic effects. In July 1992 we issued a supplemental report responding to objections and questions regarding our initial report. Since that time, the FCC issued an order denying exogenous treatment for any SFAS 106 costs for the Price Cap LECs. After reviewing the order and discussing it with the Commission's staff, the USTA has concluded that the FCC may not have fully appreciated the conservative nature of our study, nor the relevance and importance of the sensitivity analysis included in the original report. As a result, the USTA has asked Godwins to produce this supplemental report, which more fully describes the fundamental conservatism of our approach and presents the results of a newly expanded sensitivity analysis.

Respectfully submitted,



Peter J. Neuwirth, F.S.A., M.A.A.A.



Andrew B. Abel, Ph.D.

INTRODUCTION

The fundamental results of the initial Godwins study were derived by the use of a macroeconomic model, as described beginning on page 26 of Godwins' February, 1992 report. This model takes as input six basic parameters. In choosing the values for those six parameters we utilized the best available information. When there was a great deal of information available we chose as accurate a value as possible for the given parameter. When such information was lacking we were conservative and chose a value which would, if anything, overstate the impact of SFAS 106 on GNP-PI.

In its recent order, the FCC challenged two aspects of the Godwins study. First, in comparing the analysis performed by our firm with one performed by NERA, the FCC expressed concern that the studies relied upon different assumptions regarding the impact of SFAS 106 on companies' pricing decisions. Secondly, the FCC expressed concern that our results might be unreliable due to the wide variety of possible parameter input value combinations which might be applicable.

Section I of this report addresses the first issue raised by the FCC, while Sections II and III address the FCC's second concern. Specifically, Section I demonstrates that while the basic underlying assumptions as to pricing behavior may differ between the Godwins and NERA studies, the approach chosen by Godwins is, in fact, more conservative than that used by NERA.

With respect to the FCC's second concern, we point out that Section IV of Godwins' original report described a sensitivity analysis that was performed in order to determine how much our results would change if we had chosen different values for the parameters. While we believe this should have been sufficient to address any concerns as to the reliability of our results, we have now expanded that sensitivity analysis considerably. Section II of this report examines the six parameters separately, and determines the range of realistic values for each. In Section III we calculate and report what the results of our study would have been, had we used <u>any</u> possible combination of values for the six parameters.

SECTION I

DEMONSTRATION OF CONSERVATIVE NATURE OF GODWINS APPROACH RELATIVE TO NERA

In addition to the Godwins Study submitted by the USTA, a study performed by NERA was submitted to the FCC. In paragraph 62 of its order the FCC states that:

> "While Godwins assumes that companies respond to their booked costs, NERA reasons that non-regulated companies set prices based on economic costs, which are better reflected in accrual accounting than pay-as-you-go. According to NERA, non-regulated firms thus have already reflected accrued OPEB costs in their prices, but regulated firms did not, because their prices have been based upon accounted-for costs plus profits."

It seems, therefore, that NERA argues that the introduction of SFAS 106 is merely an accounting change rather than a real change in firms' costs. For unregulated firms, any effect on costs due to OPEBs had already been factored into prices prior to the introduction of SFAS 106. However, firms with regulated prices who sponsor OPEBs had not been given the opportunity to seek recovery for these OPEB costs prior to the introduction of SFAS 106. These regulated firms are the only firms in the economy whose costs and prices may increase as a direct effect of SFAS 106 as these firms seek recovery for OPEBs from regulators.

In principle, the Godwins model could be applied to calculate the effect on GNP-PI under the NERA assumption that SFAS 106 would have a direct effect only on the prices of regulated firms offering OPEBs covered by SFAS 106. To apply the Godwins model, we would let sector 1 be the unregulated sector, plus those regulated firms that do not offer OPEBs covered by SFAS 106. Sector 2 would consist of that portion of the regulated sector of the economy which sponsors OPEBs covered by SFAS 106. We would need to know the values of the following parameters: (1) the share of labor cost in total cost in sector 1; (2) the share of labor cost in total cost in sector 2; (3) the share of employment in sector 2; and (4) the direct impact of SFAS 106 on labor costs in sector 2. To obtain the values of these parameters would require an economic analysis for the first three parameters and an actuarial analysis for the fourth parameter. It is far beyond the scope of our assignment to carry out the requisite analyses to obtain reliable values for these parameters. However, we have performed two sets of illustrative calculations that clearly demonstrate that the Godwins approach is, in fact, more conservative than NERA's, and had NERA's approach been used by us, a significantly higher percentage of the LECs' SFAS 106 costs would have been found to be unrecovered by GNP-PI increases or other macroeconomic effects.

While only rough approximations to the comprehensive analysis just described, these calculations again serve to underscore the conservative nature of our original study. To reiterate, any change in the underlying assumptions in the Godwins study to be more consistent with NERA's approach would result in a much larger percentage of TELCO's SFAS 106 costs remaining unrecovered.

Illustrative Calculations Part I: One way to describe the difference between the Godwins and NERA studies is that NERA assumes OPEBs were already completely factored into the prices of (unregulated) firms before the introduction of SFAS 106, whereas Godwins assumes that no additional OPEB costs were factored into the prices of firms prior to the introduction of SFAS 106. We can look for middle ground between these two polar cases by assuming that firms had already factored in a fraction x of the increase in accounting costs due to the introduction of SFAS 106. We will let x take on the values 0, 0.25, 0.50, 0.75, and 1.0. Using the conservative baseline value of 3.0% for the direct impact of SFAS 106 on labor costs for firms offering OPEBs, these values of x correspond to values of 3.0%, 2.25%, 1.50%, 0.75% and 0% for the direct impact of SFAS 106 on labor costs for firms in sector 2. Note that with x = 1, there will be no impact on GNP-PI and no other macroeconomic effects. On the other hand, with x = 0, we will obtain the baseline results of the Godwins study.

Illustrative Calculations Part II: As stated above, under the NERA assumptions, sector 2 in the Godwins macroeconomic model should correspond to the set of regulated firms in the United States that offer OPEBs covered by SFAS 106. Clearly, the employment in these firms accounts for less than 32% of private sector employment, which is the share of private sector employees who work for firms that offer OPEBs covered by SFAS 106. We do not know exactly how much smaller than 32%, so we try various values. Specifically, we run the baseline calculations of the Godwins model except that we allow the share of private sector employment in sector 2 to be a fraction y of 32%, where y = 0.25, 0.50, 0.75, and 1.0. Thus, we let the share of private sector employment in sector 2 be 8%, 16%, 24%, and 32%. Of course, using a value of 32% is identical to the baseline calculations in the Godwins report.

The results of both of the above sets of illustrative calculations are shown in Exhibit 1 on the next page.

EXHIBIT 1

Results of Illustrative Calculations

	direct impact of SFAS 106 on labor costs in sector 2	share of private employment in sector 2	(a)	(b)	(c)
Godwins baseline:	3.00%	0.32	0.7 %	14.5 %	84.8 %
Part I:					
	0.75%	0.32	0.04%	3.77%	96.19%
	1.50%	0.32	0.17%	7.44%	92.38%
	2.25%	0.32	0.39%	11.03%	88.58%
Part II:					
	3.0%	0.24	0.57%	10.88%	88.55%
	3.0%	0.16	0.42%	7.24%	92.34%
	3.0%	0.08	0.23%	3.61%	96.16%

percentage of additional SFAS 106 costs:

(a) reflected in GNP-PI

(b) financed by potential wage reduction and other macroeconomic adjustments

(c) to be met from other sources

Values of other parameters (same as baseline values used in the original Godwins study):
price elasticity of demand = 1.5
share of labor cost in total cost, sector 1 = 0.64
share of labor cost in total cost, sector 2 = 0.64
labor supply elasticity = 0.0

SECTION II

DETERMINATION OF RANGE OF VALUES FOR INPUT PARAMETERS

In this Section we examine the development of each of the six parameters that serve as input to our macroeconomic model, and determine a basis for the expanded sensitivity analysis. The results of this analysis are described in Section III.

1. Increase in Labor Costs Due to SFAS 106

The most important input to the macroeconomic model is the impact of SFAS 106 on labor costs in the sector of the economy that provides post-retirement benefits (sector 2). In our original report we determined this value to be 3.18%. As discussed in the report, the derivation of this value required us to make certain estimates and assumptions of both a demographic and economic nature. Our approach in making those estimates was to try to be as accurate as possible when there was sufficient data to make an informed estimate, but to be conservative (i.e. overstate the impact of SFAS 106) when only limited information was available. We believe that this approach has resulted in a value which is, if anything, higher than the actual impact that SFAS 106 will have on sector 2 and hence on GNP-PI.

In spite of the above, there is no doubt that a range of possible values exists within which the true impact of SFAS 106 will lie. In our original report we prepared a sensitivity analysis that encompassed a range from 2% to 5%. That range was based on only limited quantitative analysis, but it was our opinion that the range was more than sufficient to account for any uncertainty in our baseline determination. We have now taken a closer look at that analysis and concluded that a more precisely determined range of possible values runs from 2.13% to 4.47%. Furthermore, we have looked again at the development of our baseline value, and concluded that if we had taken a "best estimate" approach on all assumptions and estimates, we would have estimated that the impact of SFAS 106 on the labor costs in sector 2 would have been 2.54%, rather than 3.18%. The remainder of this section describes how each of the end points of the range, as well as the "best estimate" value, were determined.

As noted on page 38 of our original report, the baseline value of the direct impact of SFAS 106 on sector 2 was determined by taking the impact on TELCO's labor costs (6.3%) and multiplying this value by adjustment factors (3), (4), (5), (6) and (8), described on pages 8 and 9 of the original report. These factors are as follows:

(3) BLI Ratio = .5850
(4) Demographic Adjustment = .5438
(5) Current Retiree Adjustment = .9287
(6) Pre-Funding Adjustment = 1.313
(8) Per Unit Labor Cost Adjustment = 1.3062

6.3% x .5850 x .5438 x .9287 x 1.313 x 1.3062 = 3.18%

It is clear from what is shown above that the range of possible variation around the 3.18% baseline value can be determined by looking at what value results, when each of the adjustments is determined by using either the most conservative or the least conservative possible assumptions. We have determined these extreme values for each of the five relevant adjustments, as well as noting where a "best estimate" value would differ from the baseline values shown in our report.

BLI Ratio - In calculating GNP BLI and TELCO BLI, and therefore the BLI ratio, there were two areas of uncertainty. With respect to the calculation of GNP BLI we utilized average BLIs by industry, and then utilized industry weightings derived from the GAO survey, to derive a final GNP BLI. We believe that this is the most accurate approach. The only other reasonable alternative approach would have been to utilize an aggregate employee weighted average based on our data base. As it happens this approach is slightly more conservative, and results in a BLI ratio of .5952. This can be viewed as the most conservative possible value for this factor, because the other area of uncertainty was with respect to the calculation of TELCO BLI, and there we took the most conservative approach rather than try to make a "best estimate". Specifically, in deciding how to weight the various plans sponsored by each Price Cap LEC, we decided to weight them based on employee counts. We believe this was a conservative approach because our GNP data base maintained only one set of plan provisions for each employer. If we had taken a best estimate approach and assumed that, where an employer had more than one plan, it was the more generous plan which was reported in the data base, then it would have been appropriate to utilize only the more generous plans in calculating the TELCO BLI. If we had taken this approach, the BLI ratio would have become .5478. Thus, with respect to the BLI ratio we find the following:

BLI Ratio (used in study)	.5850
BLI Ratio (most conservative)	.5952
BLI Ratio (best estimate)	.5478
BLI Ratio (least conservative)	.5478

Demographic Adjustment - We adjusted for the fact that TELCO will utilize lower rates of turnover and higher retirement rates at earlier ages than those used by other employers in determining SFAS 106 costs. We also included in this adjustment the basic demographic differences in current age and service between the TELCO population and the economy as a whole. As noted in the report, our approach to the turnover rates was a best estimate approach, for which there was solid evidence. (TELCO's demographics are themselves the result of lower turnover rates actually experienced by TELCO). A more conservative, but only marginally reasonable, approach would be to assume the same withdrawal patterns for both TELCO and GNP. There is no comparable benchmark to utilize as a least conservative approach.

The adjustment due to age and past service differences is also a best estimate approach, in that it relies on demographic data provided by the separate Price Cap LECs, averaged into a single composite TELCO census, having an average age of 41.6 with average past service of 16.6 years. Recognizing that arithmetic averages are not the same as plan weighted averages, we could have taken a more conservative approach and assumed that the TELCO population was actually one year younger and had one year less past service. This one year change is more than sufficient to take account of any differences between arithmetic and plan weighted averages. Obviously, the plan weighted average age and service for TELCO might be higher than 41.6 and 16.6, so a least conservative estimate would be to utilize 42.6 and 17.6 for TELCO's average age and service.

A degree of uncertainty is also present in our adjustment due to earlier retirement among TELCO employees. This uncertainty arises in the determination of a national average retirement age assumption. We believe our use of age 63 was a conservative assumption in that the limited data on the subject (Gerontologist Vol. 28, No. 4) seems to indicate a national average retirement age between 63.5 and 64. Furthermore, if, as expected, employers in the GNP tend to be aggressive (i.e., optimistic) in setting assumptions for accruing post-retirement liability, a less conservative and, in fact, best estimate approach would be to utilize an age 64 assumption.

Based on the above considerations we would then derive the following possible values for the Demographic Adjustment:

Demographic Adjustment (used in study) = .5438
(GNP retirement = 63)
(TELCO turnover < GNP turnover)
(Age = 41.6 Service = 16.6)

Demographic Adjustment (most conservative) = .7522
(GNP retirement = 63)
(TELCO turnover = GNP turnover)
(Age = 40.6 Service = 15.6)

Demographic Adjustment (best estimate) = .4936
(GNP retirement = 64)
(TELCO turnover < GNP turnover)
(Age = 41.6 Service = 16.6)

Demographic Adjustment (least conservative) = .4706
(GNP retirement = 64)
(TELCO turnover < GNP turnover)
(Age = 42.6 Service = 17.6)

Current Retiree Adjustment - The calculation of this adjustment was predicated on an average claim rate per retiree for the GNP of $1,802 and a ratio of retirees to covered actives of .1726. The claim rate was derived by taking the 1990 rate of $1,514, as reported in the Hewitt Associates Survey of Retiree Medical Benefits, and increasing it by 19% for medical trend inflation. This 19% is consistent with the results of Godwins Inc.'s annual survey of insurance

carrier trend rates. The ratio of retirees to covered actives was derived from the GAO study. While these represent "best estimates", both parameters could vary in either direction. We have therefore calculated a more conservative value, assuming national per retiree costs increased 25% to $1,892, and that the actual ratio of retirees to actives has increased to .2 (from .1726); and a less conservative value, assuming national per retiree costs increased 13% between 1990 and 1991, and that the ratio of covered retirees to actives decreased to .15.

Also inherent in this Adjustment is the assumption that the demography of the current TELCO retirees is identical to that of the GNP retirees. In fact, this is likely to be a somewhat conservative assumption because TELCO employees generally retire at younger ages than the national average, and thus the liabilities for TELCO will tend to be higher on this account than for the retirees in the national economy. A better assumption would therefore be to assume that retirees at TELCO were somewhat younger than those in the GNP, and hence generated a SFAS 106 cost per $1 of retiree claim cost that was 5% more than that for the GNP. A most conservative approach would be to assume that TELCO retirees are somewhat older and generated 10% less SFAS 106 cost per $1 of retiree claims, and a least conservative approach would assume 20% greater SFAS 106 cost per $1 of retiree claims than the GNP. When combined with the range of BLI ratios and Demographic Adjustments previously determined, this then results in the following values for the Current Retiree Adjustment:[1]

Current Retiree Adjustment (used in study) = .9287
(Trend = 19%)
(Retiree/active = .1726)
(TELCO retirees = GNP retirees)

Current Retiree Adjustment (most conservative) = .9232
(Trend = 25%)
(Retiree/active = .2)
(TELCO retirees older then GNP)

Current Retiree Adjustment (best estimate) = .9455
(Trend = 19%)
(Retiree/active = .1726)
(TELCO retirees younger than GNP)

Current Retiree Adjustment (least conservative) = .9076
(Trend = 13%)
(Retiree/active = .15)
(TELCO retirees much younger than GNP)

---

1 Note that the development of the range of estimates for this adjustment is not independent of previously developed ranges. Thus some of the values for this adjustment may appear "out of order".

Pre-Funding Adjustment - This adjustment looked at the effect of TELCO's existing pre-funding of post-retirement medical benefits as compared with no pre-funding. By doing this we made the most conservative assumption possible, i.e., that there is no pre-funding in the GNP. We have now recalculated this adjustment, making the more reasonable assumption that there is pre-funding in the GNP to the extent that assets equal to one year's claims have accumulated, and that annual contributions to such funds amount to claims plus 10%. We have also made the same calculation under the less conservative assumption of two years' claims accumulated and additional contributions of 20% of claims.

As a result we now have the following values:

Pre-funding Adjustment (used in study) = 1.313
Pre-funding Adjustment (most conservative) = 1.313
Pre-funding Adjustment (best estimate) = 1.205
Pre-funding Adjustment (least conservative) = 1.106

Per Unit Labor Cost Adjustment - In calculating Per Unit Labor Cost Adjustment, allocated compensation and headcount were used. No sensitivity analysis was performed on this Adjustment because of the validity of the data used and the straightforward nature of the calculation. Therefore for purposes of this analysis:

Per Unit Labor Cost Adjustment (used in study) = 1.3062
Per Unit Labor Cost Adjustment (most conservative) = 1.3062
Per Unit Labor Cost Adjustment (best estimate) = 1.3062
Per Unit Labor Cost Adjustment (least conservative) = 1.3062

Input to the Macroeconomic Model - Combining the results of the analysis described above, we find that the range of possible values for the increase in labor costs for the sector of the economy that provides post-retirement benefits encompasses the following values:

Baseline (used in study) = 6.3% x .5850 x .5438 x .9287 x 1.313 x 1.3062 = 3.18%
Most Conservative = 6.3% x .5952 x .7522 x .9232 x 1.313 x 1.3062 = 4.47%
Best Estimate = 6.3% x .5478 x .4936 x .9455 x 1.205 x 1.3062 = 2.54%
Least Conservative = 6.3% x .5478 x .4706 x .9076 x 1.106 x 1.3062 = 2.13%

2. Other Parameters

In addition to the direct impact of SFAS 106 on labor costs in sector 2, the macroeconomic model uses input values for five other parameters. For the sensitivity analysis of each of these five parameters, we use the same values as in the original Godwins Report, as discussed below. However, the current sensitivity analysis is much more extensive than in the original report. Specifically, the current sensitivity analysis examines all possible combinations of the parameter input values.

Two of the parameters are production function parameters: the share of labor cost in total cost for sector 1, and the share of labor cost in total cost for sector 2. The baseline value of each of these parameters was chosen to be 0.64, which matches the share of labor cost in total cost for the economy as a whole.[2] For the economy as a whole, the share of labor cost in total cost is remarkably constant over time. Nevertheless, the sensitivity analysis explored the effects of rather large variations in the share of labor cost in total cost for individual sectors. The range of variation was chosen to be symmetric around 0.64 and to allow the share of labor cost in total cost to be as low as 0.50 for each sector. Thus, including the baseline value, the three values used for this parameter in each sector are 0.50, 0.64, and 0.78.[3]

One of the input parameters is the share of labor employed in sector 2 (the sector which provides OPEBs subject to SFAS 106). The GAO survey cited in the original Godwins Report indicated that 30.7 million out of 95.8 million (32.0% of 95.8 million) private sector employees are eligible to receive post-retirement health benefits subject to SFAS 106. Thus, the baseline value for this parameter was chosen to be 0.32. The GAO calculated that due to possible sampling error there was a 5% probability that the figure of 30.7 million could be either higher than 37.5 million (39.1% of 95.8 million) or lower than 23.9 million (24.9% of 95.8 million). Thus, including the baseline value, the three values used for this parameter are: 0.24, 0.32, and 0.40.

---

2 Labor income is computed as total compensation of employees plus two-thirds of total proprietors' income with inventory valuation and capital consumption adjustment. Using data on these components of labor income from Table B-22 of the 1993 *Economic Report of the President*, and data on GDP and GNP from Table B-20 of the 1993 *Economic Report of the President*, we obtain the following results for labor cost as a share of output:

labor cost	1987	1988	1989	1990	1991
as a share of GDP:	64.0%	64.0%	63.5%	64.0%	64.0%
as a share of GNP:	63.9%	63.9%	63.3%	63.8%	63.8%

3 As explained in some detail on page 17, the share of labor cost in total cost in the overall economy will not equal 0.64 (except for coincidence) when the share of labor cost in total cost takes on a value other than 0.64 in one or both sectors. Exhibit 3 reports the results of sensitivity analyses that vary the share of labor cost in total cost in each sector while maintaining an overall share of labor cost in total cost equal to 0.64.

Another input parameter is the price elasticity of demand for goods in each sector. Estimates of price elasticities of demand for various goods typically find elasticities to be about 1.0 or smaller,[4] and had we adopted a best estimate approach this is the value we would have used. Furthermore, broader categories of goods tend to have smaller price elasticities than do narrower categories of goods. The two categories of goods used in the macroeconomic model are extremely broad: one category accounts for about 2/3 of private sector output and the other category accounts for about 1/3 of private sector output. The price elasticities of demand for these two categories of goods are almost surely less than 1.0. Nevertheless, to guard against the possibility of understating the effect on GNP-PI of the introduction of SFAS 106, we purposely used values of the price elasticity of demand that are almost surely too high. Specifically, the baseline calculation uses a value of 1.5 for the price elasticity of demand. In addition to this baseline value, the sensitivity analysis considers a price elasticity of demand of 3.0. This value is too high to be plausible and its inclusion in the sensitivity analysis should be regarded simply as an exercise to show the sensitivity of the model's results to changes in the price elasticity of demand.

Finally, the model uses an input value for the wage elasticity of labor supply. The appropriate concept to be used here is a long-run labor supply elasticity rather than a short-run labor supply elasticity. The long-run elasticity is appropriate because the introduction of SFAS 106 represents a permanent change in the cost of labor for firms offering post-retirement health benefits covered by SFAS 106. Furthermore, the model is set up to focus on the long-run equilibrium after all adjustments have taken place. The importance of the distinction between long-run and short-run labor supply elasticities is that long-run labor supply elasticities tend to be smaller than short-run labor supply elasticities. Indeed, the long-run labor supply elasticity is probably even slightly negative. However, to guard against understating the impact on GNP-PI of the introduction of SFAS 106, the baseline calculation uses a value of 0.0 for the labor supply elasticity, which probably slightly overstates the true value of this elasticity. The sensitivity analysis explores the influence of this parameter on the model's results by examining labor supply elasticities of 0.1, 0.2, and 0.3 in addition to the baseline value of 0.0.

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4 See, for example, Michael Parkin, *Economics*, Addison Wesley Publishing, 1993, Second Edition. Table 5.3 on page 109 lists price elasticities of demand for 20 industries in the United States. The elasticities range from 0.32 for coal to 1.52 for metals. Twelve of the elasticities are smaller than 1.0 and eight are larger than 1.0. The median price elasticity in the table is 0.9.

The table below summarizes the different values of each of the six input parameters to the macroeconomic model:

	Range of Values for Sensitivity Analysis	Best Estimate Values
Direct impact of SFAS 106 on labor cost in sector 2:	2.0%, 3.0%, 4.5%	2.5%
Labor share in total cost, sector 1:[5]	0.50, 0.64, 0.78	0.64
Labor share in total cost, sector 2:[5]	0.50, 0.64, 0.78	0.64
Fraction of labor employed in sector 2:	0.24, 0.32, 0.40	0.32
Price elasticity of demand:	1.5, 3.0	1.0
Labor supply elasticity:	0.0, 0.1, 0.2, 0.3	0.0

The total number of possible combinations of parameter values in the sensitivity analysis is found by multiplying the number of values of each parameter. This multiplication (3 x 3 x 3 x 3 x 2 x 4) yields 648 combinations of values. The current sensitivity analysis examines <u>all</u> of these combinations.

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5 See Footnote 3 on page 11.

SECTION III

SUMMARY OF THE RESULTS OF SENSITIVITY ANALYSIS

The purpose of this section is to describe the results obtained when the "best estimate" parameters, as well as the remainder of the 648 combinations of parameter values described in the previous Section, are input to the macroeconomic model.

Best Estimate Results

When the best estimate values are input to the macroeconomic model, we find that only 0.3% of the increase in the LECs' costs due to SFAS 106 are recovered through the GNP-PI, while an additional 12.3% might be recovered through additional macroeconomic effects. Thus, under this scenario 87.3% of the increase remains unrecovered. This compares with our prior baseline result of 84.8% of the cost increase being unrecovered.

Results of Comprehensive Sensitivity Analysis

As noted earlier, we input all 648 combinations of parameter values into our macroeconomic model and tabulated the results. These results are enumerated in Exhibit 2, which begins on page 19 of this Section.

One new technical issue arose during the sensitivity analysis, when we varied the share of labor cost in total cost in sectors 1 and 2. When the share of labor cost in total cost is different in sector 1 than in sector 2, the equilibrium rental cost of capital in the model (the variable "r" in equation (A19) in Appendix C of the Godwins Report) changes. If the rental cost of capital decreases, then the LECs benefit from this decrease just as they benefit from the reduction in the equilibrium wage rate. However, if the rental cost of capital increases, then this increase in rental cost tends to offset the benefit to the LECs of the reduction in the wage rate. In some cases, the effect of the change in the rental cost can more than offset the reduction in the wage rate, thus leading to a negative value reported in column (B) [percentage of TELCO's additional SFAS 106 costs financed by potential reduction in relative wage and other macroeconomic effects]. This consideration of the effect of the rental cost did not arise in the discussion of the baseline calculation because both sectors had the same share of labor cost in total cost, and thus the rental cost of capital did not change in the baseline calculation.

Discussion of Extreme Values

In the sensitivity analysis reported in Appendix C of the July 1992 Supplemental Report, the lowest value for the share of additional SFAS 106 costs to be met from other sources was 60.1%. In the current sensitivity analysis which examines all 648 combinations of parameter values, some of the combinations of parameter values lead to values below 60.1% for the share of additional SFAS 106 costs to

be met from other sources. Below we explain why some of the combinations of parameter values lead to values below 60.1% and why these low values should be completely ignored.

Question 1: **Why do some combinations of parameter values in the current sensitivity analysis lead to a result lower than 60.1%?**

As stated in the July 1992 Supplemental Report, there are 648 combinations of parameter values. At the time of writing that report, we did not have the program available to analyze all of these combinations in an expeditious manner, so we had to choose a subset of those combinations to examine. Our choice of parameter values was guided by looking at the effects of changing one parameter at a time. As stated in the July 1992 Supplemental Report (p. 31), *"Four of the parameters were each set at the value that led to the largest increase in GNP-PI when the parameters were varied one at a time. (Price elasticity of demand = 3.0; share of labor costs in total cost, sector 1 = 0.78; share of labor costs in total cost, sector 2 = 0.78; initial fraction of labor force employed in sector 2 = 0.4.)"* We then examined all possible combinations of the remaining two parameters (four values of the labor supply elasticity, and three values of the direct impact of SFAS 106 on labor costs in sector 2). As it turned out, among these 12 combinations, the lowest value of the percentage of additional SFAS 106 costs to be met from other sources (60.1% in column (C)) was obtained when the labor supply elasticity and the direct impact of SFAS 106 on labor costs in sector 2 were each set at the values that led to the largest increase in GNP-PI when the parameters were varied one at a time (labor supply elasticity = 0.3, and direct impact of SFAS 106 on labor costs in sector 2 = 5%).

Subsequent to the completion of the July 1992 Supplemental Report, we developed a computer program to examine several hundred parameter combinations expeditiously. We used this program to examine all 648 combinations of parameters in the original Godwins report and in the July 1992 Supplemental Report. This analysis revealed that the combination of parameters leading to 60.1% for column (C) is indeed the combination of parameter values that produces the largest effect on GNP-PI [reported in column (A)]. Specifically, that combination of parameter values produced a value of 26.0% for the percentage of incremental SFAS 106 costs reflected in GNP-PI [column (A)], and this value of 26.0% was the highest value among all 648 combinations. However, as it turned out, the combination of parameter values that yields the highest value in column (A) does not locate the combination that yields the lowest value in column (C). The reason is that column (C) is calculated as:

$$\text{column (C)} = 100\% - \text{column (A)} - \text{column (B)}$$

where column (B) is the percentage of additional SFAS 106 costs financed by a potential reduction in the wage rate and other macroeconomic effects (including any change in the rental cost of capital).

The smallest value in column (C) corresponds to the highest value of [column (A) + column (B)]. As it turned out, the sensitivity analysis in the July 1992 Supplemental Report successfully located the highest value of column (A) among all 648 combinations but did not locate the highest value of [column (A) + column (B)]. Specifically, the earlier sensitivity analysis did not include some combinations of parameter values that lead to a relatively large reduction in the wage rate and/or the rental cost of capital, thereby leading to relatively large values of column (B).

To sum up, because the sensitivity analysis in the July 1992 Supplemental Report did not examine all 648 combinations of parameter values, it did not locate the lowest value of (C). The current sensitivity analysis examines all 648 combinations of parameter values.

Question 2: Why should we completely ignore those combinations of parameter values that lead to values smaller than 60.1% for the percentage of additional SFAS 106 costs to be met from other sources [column (C)]?

The current sensitivity analysis examines a complete set of 648 combinations of parameter values. Ten of these combinations lead to values in column (C) smaller than 60.1%. All ten of these parameter combinations have the following characteristics:

1. The price elasticity of demand is 3.0. As discussed on page 12, the price elasticities of demand for sectors 1 and 2 are almost surely less than 1.0. A value of 1.5 for the price elasticity of demand was used in the baseline calculation to guard against understating the impact of SFAS 106 on GNP-PI. The value of 3.0 used in the sensitivity analysis is too high to be plausible, and we recommend ignoring calculations that use a value of 3.0 for the price elasticity of demand.

2. The direct impact of SFAS 106 on labor costs in sector 2 is 4.5%, which is an upper bound on the true value of this parameter according to the sensitivity analysis of the actuarial study. In fact, this value is well beyond both the best estimate of 2.5% and the more conservative baseline value of 3.0%.

3. The share of labor cost in total cost is 0.78 in sector 1 and less than 0.78 (either 0.64 or 0.50) in sector 2 (the sector that provides OPEBs subject to SFAS 106). However, we are very

confident that for the economy as a whole the share of labor cost in total cost is 0.64.[6] When the share of labor cost in total cost is set equal to 0.64 in both sectors, then the overall share of labor cost in total cost is 0.64, which matches the actual data. But when the share of labor cost in total cost is not set equal to 0.64 in both sectors, the overall share of labor cost in total cost does not equal 0.64, except by coincidence.

Additional Sensitivity Analysis

Having noted that the share of labor cost in total cost is 0.64 in the U.S. economy (comment #3 directly above), we performed an additional sensitivity analysis that takes account of this fact. In the model, the overall share of labor cost in total cost depends on the share of labor cost in total cost in each sector, as well as on the share of employment in sector 2 (the sector that provides OPEBs subject to SFAS 106). Rather than allowing the share of labor cost in total cost in sector 1, the share of labor cost in total cost in sector 2, and the share of employment in sector 2 to be varied independently of each other, the additional sensitivity analysis requires that these three parameters be varied in a way such that the share of labor cost in total cost for the whole economy is 0.64. Specifically, the share of labor cost in total cost in sector 2 is allowed to take on the values 0.5, 0.64 and 0.78; and the share of employment in sector 2 is allowed to take on the values 0.24, 0.32 and 0.40. For each of these combinations of parameter values, the share of labor cost in total cost in sector 1 is chosen so that in the overall economy the share of labor cost in total cost is 0.64. This additional sensitivity analysis has 216 combinations of parameter values (there are only 1/3 as many combinations because the share of labor cost in total cost in sector 1 is no longer varied independently of the share of labor cost in total cost in sector 2 and the share of employment in sector 2). The results of these runs are shown in Exhibit 3, beginning on page 34.

In this new sensitivity analysis, there were four (4) combinations of parameter values for which the percentage of additional SFAS 106 costs to be met from other sources [column (C)] is less than 60.1%. All four (4) of these parameter combinations have the following characteristics:

1. The price elasticity of demand equals 3.0. As explained above, this value of the price elasticity of demand is just too high to be believed, and we should ignore these combinations of parameter values.

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6 See Footnote 2 on page 11.

2. The direct impact of SFAS 106 on labor costs in sector 2 is 4.5%, which is an upper bound on the true value of this parameter according to the sensitivity analysis of the actuarial study. As noted earlier this value is much higher than either the best estimate value or the conservative baseline value used in the original study.

3. The share of employment in sector 2 is 0.4. According to the GAO study cited in the original Godwins study, the probability is greater than 97.5% that the true value of this parameter is less than 0.4.

In summary, many of the combinations of parameters, including all of the combinations that yield less than 60.1% in column (C), are simply not worthy of consideration.

USTA

EXHIBIT 2

Inputs:

(1) Percentage increase in Labor Cost in Sector of Economy Subject to SFAS 106
(2) Share of Employment in Sector Subject to SFAS 106
(3) Labor Cost as a Share of Total Cost in Sector Subject to SFAS 106
(4) Labor Cost as a Share of Total Cost in Sector Not Subject to SFAS 106
(5) Labor Supply Elasticity for U.S. Economy
(6) Price Elasticity of Demand in each Sector

Results:

Percentage of Telco's Additional SFAS 106 Costs -

(A) Reflected in GNP-PI
(B) Financed by Potential Reductions in National Average Wage Rate and Other Macroeconomic Effects
(C) To be Met by Other Sources

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	24%	50%	50%	0	1.5	0.2%	7.4%	92.4%
2%	24%	50%	50%	0.1	1.5	1.3%	6.4%	92.3%
2%	24%	50%	50%	0.2	1.5	2.3%	5.5%	92.2%
2%	24%	50%	50%	0.3	1.5	3.2%	4.7%	92.1%
2%	24%	50%	50%	0	3	0.3%	7.3%	92.4%
2%	24%	50%	50%	0.1	3	1.4%	6.3%	92.3%
2%	24%	50%	50%	0.2	3	2.4%	5.4%	92.2%
2%	24%	50%	50%	0.3	3	3.3%	4.6%	92.1%
2%	24%	50%	64%	0	1.5	0.2%	7.9%	91.8%
2%	24%	50%	64%	0.1	1.5	1.5%	6.9%	91.6%
2%	24%	50%	64%	0.2	1.5	2.7%	6.0%	91.3%
2%	24%	50%	64%	0.3	1.5	3.8%	5.1%	91.1%
2%	24%	50%	64%	0	3	0.4%	9.4%	90.2%
2%	24%	50%	64%	0.1	3	1.4%	8.6%	90.0%
2%	24%	50%	64%	0.2	3	2.4%	7.8%	89.8%
2%	24%	50%	64%	0.3	3	3.3%	7.1%	89.6%
2%	24%	50%	78%	0	1.5	0.3%	9.3%	90.4%
2%	24%	50%	78%	0.1	1.5	1.7%	8.3%	90.1%
2%	24%	50%	78%	0.2	1.5	3.0%	7.3%	89.7%
2%	24%	50%	78%	0.3	1.5	4.2%	6.4%	89.4%
2%	24%	50%	78%	0	3	0.4%	14.2%	85.4%
2%	24%	50%	78%	0.1	3	1.4%	13.4%	85.2%
2%	24%	50%	78%	0.2	3	2.3%	12.7%	85.0%
2%	24%	50%	78%	0.3	3	3.2%	12.0%	84.8%
2%	24%	64%	50%	0	1.5	0.2%	7.1%	92.7%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	24%	64%	50%	0.1	1.5	1.4%	6.0%	92.5%
2%	24%	64%	50%	0.2	1.5	2.6%	5.0%	92.4%
2%	24%	64%	50%	0.3	1.5	3.6%	4.1%	92.2%
2%	24%	64%	50%	0	3	0.4%	6.0%	93.6%
2%	24%	64%	50%	0.1	3	1.8%	4.8%	93.4%
2%	24%	64%	50%	0.2	3	3.1%	3.7%	93.2%
2%	24%	64%	50%	0.3	3	4.3%	2.6%	93.1%
2%	24%	64%	64%	0	1.5	0.3%	7.4%	92.4%
2%	24%	64%	64%	0.1	1.5	1.7%	6.3%	92.0%
2%	24%	64%	64%	0.2	1.5	3.1%	5.3%	91.7%
2%	24%	64%	64%	0.3	1.5	4.3%	4.3%	91.4%
2%	24%	64%	64%	0	3	0.5%	7.2%	92.3%
2%	24%	64%	64%	0.1	3	1.9%	6.1%	92.0%
2%	24%	64%	64%	0.2	3	3.2%	5.1%	91.6%
2%	24%	64%	64%	0.3	3	4.5%	4.2%	91.3%
2%	24%	64%	78%	0	1.5	0.3%	8.8%	90.9%
2%	24%	64%	78%	0.1	1.5	1.9%	7.7%	90.4%
2%	24%	64%	78%	0.2	1.5	3.4%	6.6%	90.0%
2%	24%	64%	78%	0.3	1.5	4.9%	5.6%	89.5%
2%	24%	64%	78%	0	3	0.5%	12.7%	86.8%
2%	24%	64%	78%	0.1	3	1.9%	11.7%	86.4%
2%	24%	64%	78%	0.2	3	3.1%	10.8%	86.0%
2%	24%	64%	78%	0.3	3	4.4%	10.0%	85.7%
2%	24%	78%	50%	0	1.5	0.2%	6.6%	93.1%
2%	24%	78%	50%	0.1	1.5	1.6%	5.5%	92.9%
2%	24%	78%	50%	0.2	1.5	2.8%	4.4%	92.7%
2%	24%	78%	50%	0.3	1.5	4.0%	3.5%	92.5%
2%	24%	78%	50%	0	3	0.4%	4.5%	95.1%
2%	24%	78%	50%	0.1	3	2.1%	3.0%	94.9%
2%	24%	78%	50%	0.2	3	3.7%	1.7%	94.6%
2%	24%	78%	50%	0.3	3	5.1%	0.4%	94.4%
2%	24%	78%	64%	0	1.5	0.3%	6.5%	93.2%
2%	24%	78%	64%	0.1	1.5	1.9%	5.3%	92.8%
2%	24%	78%	64%	0.2	1.5	3.4%	4.2%	92.4%
2%	24%	78%	64%	0.3	1.5	4.8%	3.2%	92.0%
2%	24%	78%	64%	0	3	0.5%	3.7%	95.7%
2%	24%	78%	64%	0.1	3	2.4%	2.4%	95.3%
2%	24%	78%	64%	0.2	3	4.1%	1.1%	94.8%
2%	24%	78%	64%	0.3	3	5.7%	-0.1%	94.4%
2%	24%	78%	78%	0	1.5	0.4%	7.3%	92.3%
2%	24%	78%	78%	0.1	1.5	2.1%	6.2%	91.7%
2%	24%	78%	78%	0.2	1.5	3.9%	5.0%	91.1%
2%	24%	78%	78%	0.3	1.5	5.5%	3.9%	90.6%
2%	24%	78%	78%	0	3	0.7%	7.1%	92.2%
2%	24%	78%	78%	0.1	3	2.4%	6.0%	91.6%
2%	24%	78%	78%	0.2	3	4.1%	4.8%	91.0%
2%	24%	78%	78%	0.3	3	5.8%	3.7%	90.5%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	32%	50%	50%	0	1.5	0.2%	9.9%	89.9%
2%	32%	50%	50%	0.1	1.5	1.7%	8.6%	89.8%
2%	32%	50%	50%	0.2	1.5	3.1%	7.3%	89.6%
2%	32%	50%	50%	0.3	1.5	4.3%	6.2%	89.5%
2%	32%	50%	50%	0	3	0.4%	9.7%	89.9%
2%	32%	50%	50%	0.1	3	1.8%	8.4%	89.7%
2%	32%	50%	50%	0.2	3	3.2%	7.2%	89.6%
2%	32%	50%	50%	0.3	3	4.4%	6.1%	89.5%
2%	32%	50%	64%	0	1.5	0.3%	10.5%	89.3%
2%	32%	50%	64%	0.1	1.5	1.9%	9.1%	88.9%
2%	32%	50%	64%	0.2	1.5	3.5%	7.9%	88.6%
2%	32%	50%	64%	0.3	1.5	4.9%	6.7%	88.3%
2%	32%	50%	64%	0	3	0.4%	12.1%	87.5%
2%	32%	50%	64%	0.1	3	1.9%	10.9%	87.2%
2%	32%	50%	64%	0.2	3	3.2%	9.8%	87.0%
2%	32%	50%	64%	0.3	3	4.4%	8.8%	86.7%
2%	32%	50%	78%	0	1.5	0.3%	11.8%	87.9%
2%	32%	50%	78%	0.1	1.5	2.1%	10.4%	87.5%
2%	32%	50%	78%	0.2	1.5	3.8%	9.1%	87.0%
2%	32%	50%	78%	0.3	1.5	5.4%	7.9%	86.6%
2%	32%	50%	78%	0	3	0.5%	16.6%	82.9%
2%	32%	50%	78%	0.1	3	1.8%	15.6%	82.6%
2%	32%	50%	78%	0.2	3	3.1%	14.6%	82.4%
2%	32%	50%	78%	0.3	3	4.3%	13.6%	82.1%
2%	32%	64%	50%	0	1.5	0.2%	9.5%	90.3%
2%	32%	64%	50%	0.1	1.5	1.9%	8.0%	90.0%
2%	32%	64%	50%	0.2	1.5	3.5%	6.7%	89.8%
2%	32%	64%	50%	0.3	1.5	4.9%	5.5%	89.6%
2%	32%	64%	50%	0	3	0.4%	8.1%	91.5%
2%	32%	64%	50%	0.1	3	2.3%	6.5%	91.2%
2%	32%	64%	50%	0.2	3	4.1%	5.0%	90.9%
2%	32%	64%	50%	0.3	3	5.7%	3.6%	90.7%
2%	32%	64%	64%	0	1.5	0.3%	9.8%	89.8%
2%	32%	64%	64%	0.1	1.5	2.2%	8.4%	89.4%
2%	32%	64%	64%	0.2	1.5	4.0%	7.0%	88.9%
2%	32%	64%	64%	0.3	1.5	5.7%	5.8%	88.5%
2%	32%	64%	64%	0	3	0.6%	9.7%	89.8%
2%	32%	64%	64%	0.1	3	2.5%	8.2%	89.3%
2%	32%	64%	64%	0.2	3	4.3%	6.9%	88.9%
2%	32%	64%	64%	0.3	3	5.9%	5.6%	88.5%
2%	32%	64%	78%	0	1.5	0.4%	11.4%	88.3%
2%	32%	64%	78%	0.1	1.5	2.5%	9.9%	87.6%
2%	32%	64%	78%	0.2	1.5	4.5%	8.5%	87.0%
2%	32%	64%	78%	0.3	1.5	6.4%	7.2%	86.4%
2%	32%	64%	78%	0	3	0.6%	15.6%	83.7%
2%	32%	64%	78%	0.1	3	2.4%	14.4%	83.2%
2%	32%	64%	78%	0.2	3	4.1%	13.1%	82.7%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	32%	64%	78%	0.3	3	5.8%	12.0%	82.2%
2%	32%	78%	50%	0	1.5	0.3%	8.8%	90.9%
2%	32%	78%	50%	0.1	1.5	2.1%	7.3%	90.6%
2%	32%	78%	50%	0.2	1.5	3.8%	5.9%	90.3%
2%	32%	78%	50%	0.3	1.5	5.4%	4.6%	90.0%
2%	32%	78%	50%	0	3	0.5%	6.0%	93.6%
2%	32%	78%	50%	0.1	3	2.7%	4.1%	93.2%
2%	32%	78%	50%	0.2	3	4.8%	2.3%	92.9%
2%	32%	78%	50%	0.3	3	6.8%	0.6%	92.6%
2%	32%	78%	64%	0	1.5	0.4%	8.7%	91.0%
2%	32%	78%	64%	0.1	1.5	2.5%	7.1%	90.4%
2%	32%	78%	64%	0.2	1.5	4.5%	5.7%	89.8%
2%	32%	78%	64%	0.3	1.5	6.4%	4.3%	89.3%
2%	32%	78%	64%	0	3	0.6%	5.2%	94.1%
2%	32%	78%	64%	0.1	3	3.1%	3.4%	93.5%
2%	32%	78%	64%	0.2	3	5.3%	1.8%	92.9%
2%	32%	78%	64%	0.3	3	7.5%	0.2%	92.3%
2%	32%	78%	78%	0	1.5	0.4%	9.8%	89.8%
2%	32%	78%	78%	0.1	1.5	2.8%	8.2%	89.0%
2%	32%	78%	78%	0.2	1.5	5.1%	6.7%	88.2%
2%	32%	78%	78%	0.3	1.5	7.3%	5.2%	87.5%
2%	32%	78%	78%	0	3	0.8%	9.6%	89.6%
2%	32%	78%	78%	0.1	3	3.2%	8.0%	88.9%
2%	32%	78%	78%	0.2	3	5.4%	6.5%	88.1%
2%	32%	78%	78%	0.3	3	7.6%	5.0%	87.4%
2%	40%	50%	50%	0	1.5	0.2%	12.4%	87.4%
2%	40%	50%	50%	0.1	1.5	2.1%	10.7%	87.2%
2%	40%	50%	50%	0.2	1.5	3.8%	9.2%	87.0%
2%	40%	50%	50%	0.3	1.5	5.3%	7.8%	86.9%
2%	40%	50%	50%	0	3	0.4%	12.2%	87.4%
2%	40%	50%	50%	0.1	3	2.3%	10.6%	87.2%
2%	40%	50%	50%	0.2	3	3.9%	9.1%	87.0%
2%	40%	50%	50%	0.3	3	5.5%	7.7%	86.8%
2%	40%	50%	64%	0	1.5	0.3%	13.0%	86.8%
2%	40%	50%	64%	0.1	1.5	2.3%	11.3%	86.4%
2%	40%	50%	64%	0.2	1.5	4.3%	9.7%	86.0%
2%	40%	50%	64%	0.3	1.5	6.0%	8.3%	85.7%
2%	40%	50%	64%	0	3	0.5%	14.6%	85.0%
2%	40%	50%	64%	0.1	3	2.3%	13.1%	84.6%
2%	40%	50%	64%	0.2	3	3.9%	11.7%	84.3%
2%	40%	50%	64%	0.3	3	5.5%	10.5%	84.1%
2%	40%	50%	78%	0	1.5	0.3%	14.2%	85.5%
2%	40%	50%	78%	0.1	1.5	2.5%	12.5%	85.0%
2%	40%	50%	78%	0.2	1.5	4.6%	10.9%	84.5%
2%	40%	50%	78%	0.3	1.5	6.5%	9.4%	84.1%
2%	40%	50%	78%	0	3	0.5%	18.7%	80.8%
2%	40%	50%	78%	0.1	3	2.2%	17.3%	80.5%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	40%	50%	78%	0.2	3	3.8%	16.0%	80.1%
2%	40%	50%	78%	0.3	3	5.3%	14.8%	79.9%
2%	40%	64%	50%	0	1.5	0.3%	11.9%	87.9%
2%	40%	64%	50%	0.1	1.5	2.4%	10.1%	87.5%
2%	40%	64%	50%	0.2	1.5	4.4%	8.4%	87.2%
2%	40%	64%	50%	0.3	1.5	6.2%	6.9%	86.9%
2%	40%	64%	50%	0	3	0.5%	10.2%	89.3%
2%	40%	64%	50%	0.1	3	2.9%	8.2%	88.9%
2%	40%	64%	50%	0.2	3	5.0%	6.4%	88.6%
2%	40%	64%	50%	0.3	3	7.1%	4.7%	88.2%
2%	40%	64%	64%	0	1.5	0.3%	12.3%	87.3%
2%	40%	64%	64%	0.1	1.5	2.8%	10.5%	86.7%
2%	40%	64%	64%	0.2	1.5	5.0%	8.8%	86.2%
2%	40%	64%	64%	0.3	1.5	7.1%	7.2%	85.7%
2%	40%	64%	64%	0	3	0.6%	12.1%	87.3%
2%	40%	64%	64%	0.1	3	3.0%	10.3%	86.7%
2%	40%	64%	64%	0.2	3	5.3%	8.6%	86.1%
2%	40%	64%	64%	0.3	3	7.4%	7.0%	85.6%
2%	40%	64%	78%	0	1.5	0.4%	13.9%	85.7%
2%	40%	64%	78%	0.1	1.5	3.0%	12.1%	84.9%
2%	40%	64%	78%	0.2	1.5	5.5%	10.3%	84.2%
2%	40%	64%	78%	0.3	1.5	7.8%	8.7%	83.5%
2%	40%	64%	78%	0	3	0.7%	18.2%	81.1%
2%	40%	64%	78%	0.1	3	3.0%	16.6%	80.4%
2%	40%	64%	78%	0.2	3	5.1%	15.1%	79.8%
2%	40%	64%	78%	0.3	3	7.2%	13.6%	79.2%
2%	40%	78%	50%	0	1.5	0.3%	11.1%	88.6%
2%	40%	78%	50%	0.1	1.5	2.7%	9.1%	88.2%
2%	40%	78%	50%	0.2	1.5	4.9%	7.4%	87.8%
2%	40%	78%	50%	0.3	1.5	6.9%	5.7%	87.4%
2%	40%	78%	50%	0	3	0.5%	7.5%	92.0%
2%	40%	78%	50%	0.1	3	3.4%	5.1%	91.5%
2%	40%	78%	50%	0.2	3	6.0%	2.9%	91.1%
2%	40%	78%	50%	0.3	3	8.5%	0.9%	90.6%
2%	40%	78%	64%	0	1.5	0.4%	11.0%	88.6%
2%	40%	78%	64%	0.1	1.5	3.1%	9.0%	87.9%
2%	40%	78%	64%	0.2	1.5	5.7%	7.2%	87.2%
2%	40%	78%	64%	0.3	1.5	8.1%	5.4%	86.5%
2%	40%	78%	64%	0	3	0.7%	6.9%	92.4%
2%	40%	78%	64%	0.1	3	3.7%	4.7%	91.6%
2%	40%	78%	64%	0.2	3	6.6%	2.6%	90.8%
2%	40%	78%	64%	0.3	3	9.3%	0.6%	90.1%
2%	40%	78%	78%	0	1.5	0.5%	12.3%	87.3%
2%	40%	78%	78%	0.1	1.5	3.5%	10.3%	86.2%
2%	40%	78%	78%	0.2	1.5	6.3%	8.4%	85.3%
2%	40%	78%	78%	0.3	1.5	9.1%	6.6%	84.4%
2%	40%	78%	78%	0	3	0.9%	12.0%	87.1%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	40%	78%	78%	0.1	3	3.9%	10.0%	86.1%
2%	40%	78%	78%	0.2	3	6.7%	8.1%	85.2%
2%	40%	78%	78%	0.3	3	9.4%	6.3%	84.2%
3%	24%	50%	50%	0	1.5	0.4%	10.9%	88.7%
3%	24%	50%	50%	0.1	1.5	2.1%	9.5%	88.5%
3%	24%	50%	50%	0.2	1.5	3.6%	8.1%	88.3%
3%	24%	50%	50%	0.3	1.5	4.9%	6.9%	88.2%
3%	24%	50%	50%	0	3	0.7%	10.7%	88.6%
3%	24%	50%	50%	0.1	3	2.3%	9.2%	88.5%
3%	24%	50%	50%	0.2	3	3.8%	7.9%	88.3%
3%	24%	50%	50%	0.3	3	5.2%	6.7%	88.2%
3%	24%	50%	64%	0	1.5	0.5%	11.7%	87.8%
3%	24%	50%	64%	0.1	1.5	2.4%	10.2%	87.4%
3%	24%	50%	64%	0.2	1.5	4.2%	8.8%	87.0%
3%	24%	50%	64%	0.3	1.5	5.8%	7.5%	86.7%
3%	24%	50%	64%	0	3	0.8%	13.9%	85.3%
3%	24%	50%	64%	0.1	3	2.4%	12.6%	85.0%
3%	24%	50%	64%	0.2	3	3.9%	11.4%	84.7%
3%	24%	50%	64%	0.3	3	5.2%	10.3%	84.4%
3%	24%	50%	78%	0	1.5	0.6%	13.8%	85.7%
3%	24%	50%	78%	0.1	1.5	2.6%	12.3%	85.1%
3%	24%	50%	78%	0.2	1.5	4.6%	10.8%	84.6%
3%	24%	50%	78%	0.3	1.5	6.5%	9.4%	84.1%
3%	24%	50%	78%	0	3	0.9%	21.0%	78.2%
3%	24%	50%	78%	0.1	3	2.3%	19.8%	77.8%
3%	24%	50%	78%	0.2	3	3.7%	18.8%	77.5%
3%	24%	50%	78%	0.3	3	5.0%	17.8%	77.2%
3%	24%	64%	50%	0	1.5	0.5%	10.4%	89.1%
3%	24%	64%	50%	0.1	1.5	2.3%	8.9%	88.8%
3%	24%	64%	50%	0.2	1.5	4.0%	7.4%	88.6%
3%	24%	64%	50%	0.3	1.5	5.6%	6.1%	88.4%
3%	24%	64%	50%	0	3	0.8%	8.8%	90.4%
3%	24%	64%	50%	0.1	3	2.9%	7.0%	90.1%
3%	24%	64%	50%	0.2	3	4.8%	5.3%	89.9%
3%	24%	64%	50%	0.3	3	6.6%	3.8%	89.6%
3%	24%	64%	64%	0	1.5	0.6%	10.9%	88.5%
3%	24%	64%	64%	0.1	1.5	2.7%	9.3%	88.0%
3%	24%	64%	64%	0.2	1.5	4.7%	7.7%	87.5%
3%	24%	64%	64%	0.3	1.5	6.6%	6.3%	87.1%
3%	24%	64%	64%	0	3	1.1%	10.5%	88.4%
3%	24%	64%	64%	0.1	3	3.2%	8.9%	87.9%
3%	24%	64%	64%	0.2	3	5.2%	7.4%	87.4%
3%	24%	64%	64%	0.3	3	7.0%	6.0%	87.0%
3%	24%	64%	78%	0	1.5	0.7%	13.0%	86.4%
3%	24%	64%	78%	0.1	1.5	3.1%	11.3%	85.6%
3%	24%	64%	78%	0.2	1.5	5.3%	9.7%	84.9%
3%	24%	64%	78%	0.3	1.5	7.5%	8.3%	84.2%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	24%	64%	78%	0	3	1.2%	18.6%	80.2%
3%	24%	64%	78%	0.1	3	3.2%	17.2%	79.6%
3%	24%	64%	78%	0.2	3	5.1%	15.9%	79.0%
3%	24%	64%	78%	0.3	3	6.9%	14.7%	78.5%
3%	24%	78%	50%	0	1.5	0.5%	9.8%	89.7%
3%	24%	78%	50%	0.1	1.5	2.5%	8.1%	89.4%
3%	24%	78%	50%	0.2	1.5	4.4%	6.5%	89.1%
3%	24%	78%	50%	0.3	1.5	6.1%	5.1%	88.8%
3%	24%	78%	50%	0	3	0.9%	6.5%	92.7%
3%	24%	78%	50%	0.1	3	3.4%	4.3%	92.3%
3%	24%	78%	50%	0.2	3	5.7%	2.3%	91.9%
3%	24%	78%	50%	0.3	3	7.9%	0.5%	91.6%
3%	24%	78%	64%	0	1.5	0.7%	9.5%	89.8%
3%	24%	78%	64%	0.1	1.5	3.0%	7.8%	89.2%
3%	24%	78%	64%	0.2	1.5	5.3%	6.1%	88.6%
3%	24%	78%	64%	0.3	1.5	7.4%	4.6%	88.0%
3%	24%	78%	64%	0	3	1.2%	5.3%	93.5%
3%	24%	78%	64%	0.1	3	3.9%	3.3%	92.8%
3%	24%	78%	64%	0.2	3	6.4%	1.4%	92.2%
3%	24%	78%	64%	0.3	3	8.8%	-0.3%	91.5%
3%	24%	78%	78%	0	1.5	0.8%	10.8%	88.4%
3%	24%	78%	78%	0.1	1.5	3.5%	9.0%	87.5%
3%	24%	78%	78%	0.2	1.5	6.0%	7.3%	86.7%
3%	24%	78%	78%	0.3	1.5	8.5%	5.7%	85.8%
3%	24%	78%	78%	0	3	1.5%	10.3%	88.2%
3%	24%	78%	78%	0.1	3	4.1%	8.6%	87.3%
3%	24%	78%	78%	0.2	3	6.6%	6.9%	86.4%
3%	24%	78%	78%	0.3	3	9.0%	5.3%	85.6%
3%	32%	50%	50%	0	1.5	0.5%	14.6%	84.9%
3%	32%	50%	50%	0.1	1.5	2.7%	12.6%	84.7%
3%	32%	50%	50%	0.2	1.5	4.7%	10.8%	84.5%
3%	32%	50%	50%	0.3	1.5	6.5%	9.2%	84.3%
3%	32%	50%	50%	0	3	0.8%	14.3%	84.9%
3%	32%	50%	50%	0.1	3	3.0%	12.3%	84.6%
3%	32%	50%	50%	0.2	3	5.0%	10.6%	84.4%
3%	32%	50%	50%	0.3	3	6.8%	8.9%	84.2%
3%	32%	50%	64%	0	1.5	0.6%	15.5%	83.9%
3%	32%	50%	64%	0.1	1.5	3.1%	13.5%	83.4%
3%	32%	50%	64%	0.2	1.5	5.4%	11.6%	83.0%
3%	32%	50%	64%	0.3	1.5	7.5%	9.9%	82.6%
3%	32%	50%	64%	0	3	1.0%	17.8%	81.3%
3%	32%	50%	64%	0.1	3	3.1%	16.0%	80.9%
3%	32%	50%	64%	0.2	3	5.1%	14.5%	80.5%
3%	32%	50%	64%	0.3	3	6.9%	13.0%	80.1%
3%	32%	50%	78%	0	1.5	0.7%	17.5%	81.9%
3%	32%	50%	78%	0.1	1.5	3.4%	15.4%	81.2%
3%	32%	50%	78%	0.2	1.5	5.9%	13.5%	80.6%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	32%	50%	78%	0.3	1.5	8.3%	11.7%	80.0%
3%	32%	50%	78%	0	3	1.0%	24.6%	74.4%
3%	32%	50%	78%	0.1	3	3.0%	23.0%	74.0%
3%	32%	50%	78%	0.2	3	4.9%	21.5%	73.6%
3%	32%	50%	78%	0.3	3	6.7%	20.1%	73.2%
3%	32%	64%	50%	0	1.5	0.6%	14.0%	85.5%
3%	32%	64%	50%	0.1	1.5	3.1%	11.8%	85.1%
3%	32%	64%	50%	0.2	1.5	5.4%	9.9%	84.8%
3%	32%	64%	50%	0.3	1.5	7.5%	8.1%	84.4%
3%	32%	64%	50%	0	3	1.0%	11.8%	87.2%
3%	32%	64%	50%	0.1	3	3.8%	9.4%	86.8%
3%	32%	64%	50%	0.2	3	6.4%	7.2%	86.4%
3%	32%	64%	50%	0.3	3	8.7%	5.2%	86.1%
3%	32%	64%	64%	0	1.5	0.7%	14.5%	84.8%
3%	32%	64%	64%	0.1	1.5	3.6%	12.4%	84.1%
3%	32%	64%	64%	0.2	1.5	6.2%	10.4%	83.4%
3%	32%	64%	64%	0.3	1.5	8.8%	8.5%	82.8%
3%	32%	64%	64%	0	3	1.3%	14.1%	84.6%
3%	32%	64%	64%	0.1	3	4.1%	12.0%	83.9%
3%	32%	64%	64%	0.2	3	6.7%	10.0%	83.3%
3%	32%	64%	64%	0.3	3	9.2%	8.1%	82.7%
3%	32%	64%	78%	0	1.5	0.8%	16.8%	82.4%
3%	32%	64%	78%	0.1	1.5	4.0%	14.6%	81.4%
3%	32%	64%	78%	0.2	1.5	6.9%	12.6%	80.5%
3%	32%	64%	78%	0.3	1.5	9.8%	10.6%	79.6%
3%	32%	64%	78%	0	3	1.4%	23.0%	75.6%
3%	32%	64%	78%	0.1	3	4.1%	21.1%	74.8%
3%	32%	64%	78%	0.2	3	6.6%	19.3%	74.1%
3%	32%	64%	78%	0.3	3	9.0%	17.6%	73.4%
3%	32%	78%	50%	0	1.5	0.6%	13.0%	86.3%
3%	32%	78%	50%	0.1	1.5	3.4%	10.8%	85.9%
3%	32%	78%	50%	0.2	1.5	5.9%	8.7%	85.4%
3%	32%	78%	50%	0.3	1.5	8.3%	6.7%	85.0%
3%	32%	78%	50%	0	3	1.0%	8.6%	90.3%
3%	32%	78%	50%	0.1	3	4.4%	5.8%	89.8%
3%	32%	78%	50%	0.2	3	7.6%	3.2%	89.3%
3%	32%	78%	50%	0.3	3	10.5%	0.7%	88.8%
3%	32%	78%	64%	0	1.5	0.8%	12.8%	86.4%
3%	32%	78%	64%	0.1	1.5	4.0%	10.5%	85.5%
3%	32%	78%	64%	0.2	1.5	7.0%	8.3%	84.7%
3%	32%	78%	64%	0.3	1.5	9.9%	6.2%	83.9%
3%	32%	78%	64%	0	3	1.4%	7.5%	91.1%
3%	32%	78%	64%	0.1	3	5.0%	4.8%	90.1%
3%	32%	78%	64%	0.2	3	8.4%	2.3%	89.2%
3%	32%	78%	64%	0.3	3	11.6%	-0.0%	88.4%
3%	32%	78%	78%	0	1.5	0.9%	14.4%	84.6%
3%	32%	78%	78%	0.1	1.5	4.5%	12.1%	83.4%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	32%	78%	78%	0.2	1.5	7.9%	9.8%	82.3%
3%	32%	78%	78%	0.3	1.5	11.2%	7.7%	81.2%
3%	32%	78%	78%	0	3	1.8%	13.9%	84.3%
3%	32%	78%	78%	0.1	3	5.3%	11.6%	83.1%
3%	32%	78%	78%	0.2	3	8.7%	9.3%	82.0%
3%	32%	78%	78%	0.3	3	11.9%	7.2%	80.9%
3%	40%	50%	50%	0	1.5	0.5%	18.3%	81.2%
3%	40%	50%	50%	0.1	1.5	3.3%	15.8%	80.9%
3%	40%	50%	50%	0.2	1.5	5.8%	13.6%	80.6%
3%	40%	50%	50%	0.3	1.5	8.1%	11.5%	80.4%
3%	40%	50%	50%	0	3	0.9%	17.9%	81.1%
3%	40%	50%	50%	0.1	3	3.7%	15.5%	80.8%
3%	40%	50%	50%	0.2	3	6.1%	13.3%	80.6%
3%	40%	50%	50%	0.3	3	8.4%	11.3%	80.3%
3%	40%	50%	64%	0	1.5	0.6%	19.2%	80.2%
3%	40%	50%	64%	0.1	1.5	3.7%	16.7%	79.6%
3%	40%	50%	64%	0.2	1.5	6.5%	14.4%	79.1%
3%	40%	50%	64%	0.3	1.5	9.2%	12.2%	78.6%
3%	40%	50%	64%	0	3	1.1%	21.4%	77.5%
3%	40%	50%	64%	0.1	3	3.7%	19.3%	77.0%
3%	40%	50%	64%	0.2	3	6.2%	17.2%	76.6%
3%	40%	50%	64%	0.3	3	8.5%	15.4%	76.2%
3%	40%	50%	78%	0	1.5	0.7%	21.0%	78.3%
3%	40%	50%	78%	0.1	1.5	4.0%	18.4%	77.6%
3%	40%	50%	78%	0.2	1.5	7.1%	16.1%	76.8%
3%	40%	50%	78%	0.3	1.5	10.0%	13.9%	76.2%
3%	40%	50%	78%	0	3	1.1%	27.6%	71.3%
3%	40%	50%	78%	0.1	3	3.6%	25.6%	70.8%
3%	40%	50%	78%	0.2	3	6.0%	23.7%	70.3%
3%	40%	50%	78%	0.3	3	8.3%	21.9%	69.9%
3%	40%	64%	50%	0	1.5	0.6%	17.5%	81.9%
3%	40%	64%	50%	0.1	1.5	3.8%	14.9%	81.3%
3%	40%	64%	50%	0.2	1.5	6.7%	12.4%	80.9%
3%	40%	64%	50%	0.3	1.5	9.4%	10.2%	80.4%
3%	40%	64%	50%	0	3	1.1%	15.0%	83.9%
3%	40%	64%	50%	0.1	3	4.6%	12.0%	83.4%
3%	40%	64%	50%	0.2	3	7.9%	9.3%	82.9%
3%	40%	64%	50%	0.3	3	10.8%	6.8%	82.4%
3%	40%	64%	64%	0	1.5	0.8%	18.2%	81.0%
3%	40%	64%	64%	0.1	1.5	4.4%	15.5%	80.1%
3%	40%	64%	64%	0.2	1.5	7.7%	13.0%	79.3%
3%	40%	64%	64%	0.3	1.5	10.9%	10.6%	78.5%
3%	40%	64%	64%	0	3	1.4%	17.7%	80.9%
3%	40%	64%	64%	0.1	3	4.9%	15.1%	80.0%
3%	40%	64%	64%	0.2	3	8.3%	12.6%	79.2%
3%	40%	64%	64%	0.3	3	11.4%	10.2%	78.4%
3%	40%	64%	78%	0	1.5	0.9%	20.6%	78.6%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	40%	64%	78%	0.1	1.5	4.8%	17.8%	77.4%
3%	40%	64%	78%	0.2	1.5	8.5%	15.2%	76.3%
3%	40%	64%	78%	0.3	1.5	12.0%	12.8%	75.3%
3%	40%	64%	78%	0	3	1.6%	26.8%	71.6%
3%	40%	64%	78%	0.1	3	4.9%	24.4%	70.6%
3%	40%	64%	78%	0.2	3	8.1%	22.1%	69.7%
3%	40%	64%	78%	0.3	3	11.2%	20.0%	68.9%
3%	40%	78%	50%	0	1.5	0.7%	16.3%	83.0%
3%	40%	78%	50%	0.1	1.5	4.2%	13.5%	82.3%
3%	40%	78%	50%	0.2	1.5	7.5%	10.8%	81.7%
3%	40%	78%	50%	0.3	1.5	10.6%	8.3%	81.1%
3%	40%	78%	50%	0	3	1.1%	10.9%	88.0%
3%	40%	78%	50%	0.1	3	5.4%	7.4%	87.3%
3%	40%	78%	50%	0.2	3	9.3%	4.1%	86.6%
3%	40%	78%	50%	0.3	3	13.0%	1.0%	86.0%
3%	40%	78%	64%	0	1.5	0.9%	16.2%	83.0%
3%	40%	78%	64%	0.1	1.5	4.9%	13.2%	81.8%
3%	40%	78%	64%	0.2	1.5	8.8%	10.5%	80.7%
3%	40%	78%	64%	0.3	1.5	12.4%	7.9%	79.7%
3%	40%	78%	64%	0	3	1.6%	9.9%	88.5%
3%	40%	78%	64%	0.1	3	6.1%	6.7%	87.3%
3%	40%	78%	64%	0.2	3	10.3%	3.6%	86.1%
3%	40%	78%	64%	0.3	3	14.3%	0.6%	85.0%
3%	40%	78%	78%	0	1.5	1.0%	18.1%	80.9%
3%	40%	78%	78%	0.1	1.5	5.5%	15.2%	79.3%
3%	40%	78%	78%	0.2	1.5	9.8%	12.3%	77.9%
3%	40%	78%	78%	0.3	1.5	13.8%	9.6%	76.5%
3%	40%	78%	78%	0	3	2.0%	17.5%	80.5%
3%	40%	78%	78%	0.1	3	6.4%	14.6%	79.0%
3%	40%	78%	78%	0.2	3	10.6%	11.8%	77.6%
3%	40%	78%	78%	0.3	3	14.6%	9.1%	76.3%
4.5%	24%	50%	50%	0	1.5	0.9%	16.1%	83.1%
4.5%	24%	50%	50%	0.1	1.5	3.3%	13.9%	82.8%
4.5%	24%	50%	50%	0.2	1.5	5.6%	11.9%	82.6%
4.5%	24%	50%	50%	0.3	1.5	7.6%	10.1%	82.3%
4.5%	24%	50%	50%	0	3	1.5%	15.5%	83.0%
4.5%	24%	50%	50%	0.1	3	3.9%	13.3%	82.7%
4.5%	24%	50%	50%	0.2	3	6.1%	11.4%	82.5%
4.5%	24%	50%	50%	0.3	3	8.1%	9.6%	82.3%
4.5%	24%	50%	64%	0	1.5	1.1%	17.2%	81.7%
4.5%	24%	50%	64%	0.1	1.5	3.9%	15.0%	81.1%
4.5%	24%	50%	64%	0.2	1.5	6.5%	12.9%	80.5%
4.5%	24%	50%	64%	0.3	1.5	8.9%	11.0%	80.0%
4.5%	24%	50%	64%	0	3	1.8%	20.2%	78.0%
4.5%	24%	50%	64%	0.1	3	4.1%	18.3%	77.5%
4.5%	24%	50%	64%	0.2	3	6.3%	16.6%	77.1%
4.5%	24%	50%	64%	0.3	3	8.3%	15.0%	76.7%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	24%	50%	78%	0	1.5	1.2%	20.3%	78.5%
4.5%	24%	50%	78%	0.1	1.5	4.3%	18.0%	77.7%
4.5%	24%	50%	78%	0.2	1.5	7.2%	15.8%	76.9%
4.5%	24%	50%	78%	0.3	1.5	10.0%	13.8%	76.2%
4.5%	24%	50%	78%	0	3	1.9%	30.7%	67.4%
4.5%	24%	50%	78%	0.1	3	4.1%	29.1%	66.9%
4.5%	24%	50%	78%	0.2	3	6.1%	27.5%	66.4%
4.5%	24%	50%	78%	0.3	3	8.0%	26.0%	66.0%
4.5%	24%	64%	50%	0	1.5	1.0%	15.3%	83.7%
4.5%	24%	64%	50%	0.1	1.5	3.8%	12.9%	83.3%
4.5%	24%	64%	50%	0.2	1.5	6.3%	10.8%	83.0%
4.5%	24%	64%	50%	0.3	1.5	8.6%	8.8%	82.6%
4.5%	24%	64%	50%	0	3	1.8%	12.6%	85.6%
4.5%	24%	64%	50%	0.1	3	4.9%	9.9%	85.2%
4.5%	24%	64%	50%	0.2	3	7.7%	7.5%	84.8%
4.5%	24%	64%	50%	0.3	3	10.3%	5.2%	84.4%
4.5%	24%	64%	64%	0	1.5	1.3%	15.9%	82.8%
4.5%	24%	64%	64%	0.1	1.5	4.5%	13.5%	82.0%
4.5%	24%	64%	64%	0.2	1.5	7.4%	11.3%	81.3%
4.5%	24%	64%	64%	0.3	1.5	10.2%	9.2%	80.6%
4.5%	24%	64%	64%	0	3	2.3%	15.1%	82.6%
4.5%	24%	64%	64%	0.1	3	5.4%	12.8%	81.8%
4.5%	24%	64%	64%	0.2	3	8.4%	10.6%	81.1%
4.5%	24%	64%	64%	0.3	3	11.1%	8.5%	80.4%
4.5%	24%	64%	78%	0	1.5	1.5%	19.0%	79.5%
4.5%	24%	64%	78%	0.1	1.5	5.0%	16.6%	78.4%
4.5%	24%	64%	78%	0.2	1.5	8.4%	14.2%	77.4%
4.5%	24%	64%	78%	0.3	1.5	11.6%	12.0%	76.4%
4.5%	24%	64%	78%	0	3	2.6%	27.1%	70.2%
4.5%	24%	64%	78%	0.1	3	5.6%	25.1%	69.4%
4.5%	24%	64%	78%	0.2	3	8.3%	23.2%	68.5%
4.5%	24%	64%	78%	0.3	3	11.0%	21.3%	67.7%
4.5%	24%	78%	50%	0	1.5	1.1%	14.3%	84.6%
4.5%	24%	78%	50%	0.1	1.5	4.1%	11.8%	84.1%
4.5%	24%	78%	50%	0.2	1.5	6.9%	9.5%	83.6%
4.5%	24%	78%	50%	0.3	1.5	9.4%	7.3%	83.2%
4.5%	24%	78%	50%	0	3	2.0%	9.1%	88.9%
4.5%	24%	78%	50%	0.1	3	5.7%	5.9%	88.4%
4.5%	24%	78%	50%	0.2	3	9.1%	3.0%	87.9%
4.5%	24%	78%	50%	0.3	3	12.3%	0.3%	87.4%
4.5%	24%	78%	64%	0	1.5	1.4%	13.9%	84.7%
4.5%	24%	78%	64%	0.1	1.5	5.0%	11.3%	83.7%
4.5%	24%	78%	64%	0.2	1.5	8.3%	8.9%	82.9%
4.5%	24%	78%	64%	0.3	1.5	11.4%	6.6%	82.0%
4.5%	24%	78%	64%	0	3	2.6%	7.3%	90.0%
4.5%	24%	78%	64%	0.1	3	6.6%	4.4%	89.0%
4.5%	24%	78%	64%	0.2	3	10.3%	1.6%	88.0%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	24%	78%	64%	0.3	3	13.9%	-1.0%	87.1%
4.5%	24%	78%	78%	0	1.5	1.7%	15.8%	82.5%
4.5%	24%	78%	78%	0.1	1.5	5.7%	13.1%	81.2%
4.5%	24%	78%	78%	0.2	1.5	9.5%	10.6%	79.9%
4.5%	24%	78%	78%	0.3	1.5	13.1%	8.2%	78.7%
4.5%	24%	78%	78%	0	3	3.3%	14.7%	82.0%
4.5%	24%	78%	78%	0.1	3	7.1%	12.2%	80.7%
4.5%	24%	78%	78%	0.2	3	10.9%	9.7%	79.4%
4.5%	24%	78%	78%	0.3	3	14.4%	7.4%	78.2%
4.5%	32%	50%	50%	0	1.5	1.0%	21.5%	77.5%
4.5%	32%	50%	50%	0.1	1.5	4.3%	18.5%	77.1%
4.5%	32%	50%	50%	0.2	1.5	7.3%	15.9%	76.8%
4.5%	32%	50%	50%	0.3	1.5	10.0%	13.5%	76.5%
4.5%	32%	50%	50%	0	3	1.8%	20.8%	77.4%
4.5%	32%	50%	50%	0.1	3	5.0%	17.9%	77.1%
4.5%	32%	50%	50%	0.2	3	8.0%	15.3%	76.7%
4.5%	32%	50%	50%	0.3	3	10.7%	12.9%	76.4%
4.5%	32%	50%	64%	0	1.5	1.3%	22.7%	76.0%
4.5%	32%	50%	64%	0.1	1.5	5.0%	19.8%	75.2%
4.5%	32%	50%	64%	0.2	1.5	8.4%	17.0%	74.6%
4.5%	32%	50%	64%	0.3	1.5	11.6%	14.5%	73.9%
4.5%	32%	50%	64%	0	3	2.2%	25.9%	72.0%
4.5%	32%	50%	64%	0.1	3	5.3%	23.4%	71.4%
4.5%	32%	50%	64%	0.2	3	8.2%	21.0%	70.8%
4.5%	32%	50%	64%	0.3	3	10.8%	18.9%	70.3%
4.5%	32%	50%	78%	0	1.5	1.4%	25.7%	72.9%
4.5%	32%	50%	78%	0.1	1.5	5.4%	22.7%	71.9%
4.5%	32%	50%	78%	0.2	1.5	9.2%	19.8%	70.9%
4.5%	32%	50%	78%	0.3	1.5	12.8%	17.2%	70.1%
4.5%	32%	50%	78%	0	3	2.2%	36.0%	61.7%
4.5%	32%	50%	78%	0.1	3	5.2%	33.7%	61.1%
4.5%	32%	50%	78%	0.2	3	7.9%	31.5%	60.5%
4.5%	32%	50%	78%	0.3	3	10.6%	29.5%	60.0%
4.5%	32%	64%	50%	0	1.5	1.2%	20.5%	78.3%
4.5%	32%	64%	50%	0.1	1.5	4.9%	17.3%	77.7%
4.5%	32%	64%	50%	0.2	1.5	8.4%	14.4%	77.2%
4.5%	32%	64%	50%	0.3	1.5	11.5%	11.8%	76.7%
4.5%	32%	64%	50%	0	3	2.1%	17.0%	80.8%
4.5%	32%	64%	50%	0.1	3	6.3%	13.5%	80.2%
4.5%	32%	64%	50%	0.2	3	10.1%	10.3%	79.6%
4.5%	32%	64%	50%	0.3	3	13.6%	7.3%	79.1%
4.5%	32%	64%	64%	0	1.5	1.5%	21.3%	77.2%
4.5%	32%	64%	64%	0.1	1.5	5.8%	18.1%	76.1%
4.5%	32%	64%	64%	0.2	1.5	9.8%	15.1%	75.1%
4.5%	32%	64%	64%	0.3	1.5	13.5%	12.3%	74.2%
4.5%	32%	64%	64%	0	3	2.8%	20.3%	76.9%
4.5%	32%	64%	64%	0.1	3	7.0%	17.2%	75.8%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	32%	64%	64%	0.2	3	10.9%	14.3%	74.9%
4.5%	32%	64%	64%	0.3	3	14.5%	11.5%	73.9%
4.5%	32%	64%	78%	0	1.5	1.8%	24.7%	73.5%
4.5%	32%	64%	78%	0.1	1.5	6.4%	21.4%	72.1%
4.5%	32%	64%	78%	0.2	1.5	10.9%	18.4%	70.8%
4.5%	32%	64%	78%	0.3	1.5	15.1%	15.4%	69.5%
4.5%	32%	64%	78%	0	3	3.1%	33.6%	63.3%
4.5%	32%	64%	78%	0.1	3	7.1%	30.8%	62.2%
4.5%	32%	64%	78%	0.2	3	10.8%	28.1%	61.1%
4.5%	32%	64%	78%	0.3	3	14.4%	25.6%	60.0%
4.5%	32%	78%	50%	0	1.5	1.4%	19.1%	79.6%
4.5%	32%	78%	50%	0.1	1.5	5.5%	15.7%	78.8%
4.5%	32%	78%	50%	0.2	1.5	9.3%	12.6%	78.2%
4.5%	32%	78%	50%	0.3	1.5	12.8%	9.7%	77.5%
4.5%	32%	78%	50%	0	3	2.3%	12.2%	85.5%
4.5%	32%	78%	50%	0.1	3	7.3%	8.0%	84.7%
4.5%	32%	78%	50%	0.2	3	11.9%	4.2%	83.9%
4.5%	32%	78%	50%	0.3	3	16.2%	0.5%	83.2%
4.5%	32%	78%	64%	0	1.5	1.7%	18.7%	79.6%
4.5%	32%	78%	64%	0.1	1.5	6.5%	15.2%	78.3%
4.5%	32%	78%	64%	0.2	1.5	11.0%	12.0%	77.0%
4.5%	32%	78%	64%	0.3	1.5	15.2%	8.9%	75.9%
4.5%	32%	78%	64%	0	3	3.1%	10.4%	86.4%
4.5%	32%	78%	64%	0.1	3	8.5%	6.5%	85.0%
4.5%	32%	78%	64%	0.2	3	13.5%	2.9%	83.7%
4.5%	32%	78%	64%	0.3	3	18.2%	-0.6%	82.4%
4.5%	32%	78%	78%	0	1.5	2.1%	21.1%	76.8%
4.5%	32%	78%	78%	0.1	1.5	7.4%	17.6%	75.0%
4.5%	32%	78%	78%	0.2	1.5	12.4%	14.3%	73.3%
4.5%	32%	78%	78%	0.3	1.5	17.3%	11.0%	71.7%
4.5%	32%	78%	78%	0	3	3.9%	19.9%	76.2%
4.5%	32%	78%	78%	0.1	3	9.1%	16.4%	74.4%
4.5%	32%	78%	78%	0.2	3	14.1%	13.2%	72.8%
4.5%	32%	78%	78%	0.3	3	18.8%	10.0%	71.2%
4.5%	40%	50%	50%	0	1.5	1.2%	26.9%	72.0%
4.5%	40%	50%	50%	0.1	1.5	5.3%	23.2%	71.5%
4.5%	40%	50%	50%	0.2	1.5	9.0%	19.9%	71.1%
4.5%	40%	50%	50%	0.3	1.5	12.4%	16.9%	70.7%
4.5%	40%	50%	50%	0	3	2.0%	26.1%	71.9%
4.5%	40%	50%	50%	0.1	3	6.1%	22.5%	71.4%
4.5%	40%	50%	50%	0.2	3	9.7%	19.3%	71.0%
4.5%	40%	50%	50%	0.3	3	13.1%	16.3%	70.6%
4.5%	40%	50%	64%	0	1.5	1.4%	28.2%	70.4%
4.5%	40%	50%	64%	0.1	1.5	5.9%	24.5%	69.6%
4.5%	40%	50%	64%	0.2	1.5	10.2%	21.1%	68.8%
4.5%	40%	50%	64%	0.3	1.5	14.1%	17.9%	68.0%
4.5%	40%	50%	64%	0	3	2.4%	31.3%	66.3%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	40%	50%	64%	0.1	3	6.3%	28.1%	65.6%
4.5%	40%	50%	64%	0.2	3	9.9%	25.1%	65.0%
4.5%	40%	50%	64%	0.3	3	13.3%	22.4%	64.3%
4.5%	40%	50%	78%	0	1.5	1.6%	30.8%	67.6%
4.5%	40%	50%	78%	0.1	1.5	6.4%	27.1%	66.5%
4.5%	40%	50%	78%	0.2	1.5	11.0%	23.6%	65.4%
4.5%	40%	50%	78%	0.3	1.5	15.3%	20.3%	64.4%
4.5%	40%	50%	78%	0	3	2.5%	40.5%	57.0%
4.5%	40%	50%	78%	0.1	3	6.2%	37.5%	56.3%
4.5%	40%	50%	78%	0.2	3	9.7%	34.7%	55.6%
4.5%	40%	50%	78%	0.3	3	13.0%	32.1%	55.0%
4.5%	40%	64%	50%	0	1.5	1.4%	25.7%	72.9%
4.5%	40%	64%	50%	0.1	1.5	6.1%	21.8%	72.2%
4.5%	40%	64%	50%	0.2	1.5	10.4%	18.1%	71.4%
4.5%	40%	64%	50%	0.3	1.5	14.4%	14.8%	70.8%
4.5%	40%	64%	50%	0	3	2.4%	21.6%	76.0%
4.5%	40%	64%	50%	0.1	3	7.6%	17.3%	75.1%
4.5%	40%	64%	50%	0.2	3	12.4%	13.2%	74.4%
4.5%	40%	64%	50%	0.3	3	16.8%	9.5%	73.6%
4.5%	40%	64%	64%	0	1.5	1.7%	26.7%	71.6%
4.5%	40%	64%	64%	0.1	1.5	7.0%	22.7%	70.3%
4.5%	40%	64%	64%	0.2	1.5	12.0%	19.0%	69.0%
4.5%	40%	64%	64%	0.3	1.5	16.7%	15.5%	67.9%
4.5%	40%	64%	64%	0	3	3.1%	25.7%	71.3%
4.5%	40%	64%	64%	0.1	3	8.3%	21.7%	69.9%
4.5%	40%	64%	64%	0.2	3	13.2%	18.0%	68.7%
4.5%	40%	64%	64%	0.3	3	17.8%	14.6%	67.6%
4.5%	40%	64%	78%	0	1.5	1.9%	30.2%	67.9%
4.5%	40%	64%	78%	0.1	1.5	7.7%	26.1%	66.2%
4.5%	40%	64%	78%	0.2	1.5	13.2%	22.3%	64.5%
4.5%	40%	64%	78%	0.3	1.5	18.4%	18.6%	63.0%
4.5%	40%	64%	78%	0	3	3.5%	39.2%	57.4%
4.5%	40%	64%	78%	0.1	3	8.4%	35.6%	56.0%
4.5%	40%	64%	78%	0.2	3	13.1%	32.3%	54.6%
4.5%	40%	64%	78%	0.3	3	17.6%	29.1%	53.3%
4.5%	40%	78%	50%	0	1.5	1.5%	23.9%	74.6%
4.5%	40%	78%	50%	0.1	1.5	6.8%	19.7%	73.6%
4.5%	40%	78%	50%	0.2	1.5	11.7%	15.7%	72.6%
4.5%	40%	78%	50%	0.3	1.5	16.2%	12.1%	71.7%
4.5%	40%	78%	50%	0	3	2.5%	15.5%	82.0%
4.5%	40%	78%	50%	0.1	3	8.8%	10.3%	80.9%
4.5%	40%	78%	50%	0.2	3	14.7%	5.5%	79.9%
4.5%	40%	78%	50%	0.3	3	20.1%	0.9%	78.9%
4.5%	40%	78%	64%	0	1.5	1.9%	23.6%	74.4%
4.5%	40%	78%	64%	0.1	1.5	8.0%	19.3%	72.7%
4.5%	40%	78%	64%	0.2	1.5	13.7%	15.2%	71.1%
4.5%	40%	78%	64%	0.3	1.5	19.0%	11.4%	69.6%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	40%	78%	64%	0	3	3.5%	14.0%	82.5%
4.5%	40%	78%	64%	0.1	3	10.1%	9.1%	80.7%
4.5%	40%	78%	64%	0.2	3	16.4%	4.6%	79.0%
4.5%	40%	78%	64%	0.3	3	22.4%	0.3%	77.4%
4.5%	40%	78%	78%	0	1.5	2.3%	26.5%	71.2%
4.5%	40%	78%	78%	0.1	1.5	8.9%	22.1%	69.0%
4.5%	40%	78%	78%	0.2	1.5	15.2%	17.9%	66.8%
4.5%	40%	78%	78%	0.3	1.5	21.3%	13.9%	64.7%
4.5%	40%	78%	78%	0	3	4.4%	25.1%	70.5%
4.5%	40%	78%	78%	0.1	3	10.9%	20.8%	68.3%
4.5%	40%	78%	78%	0.2	3	17.1%	16.7%	66.2%
4.5%	40%	78%	78%	0.3	3	23.1%	12.8%	64.2%

EXHIBIT 3

Inputs:

(1) Percentage increase in Labor Cost in Sector of Economy Subject to SFAS 106
(2) Share of Employment in Sector Subject to SFAS 106
(3) Labor Cost as a Share of Total Cost in Sector Subject to SFAS 106
(4) Labor Cost as a Share of Total Cost in Sector Not Subject to SFAS 106
(5) Labor Supply Elasticity for U.S. Economy
(6) Price Elasticity of Demand in each Sector

Results:

Percentage of Telco's Additional SFAS 106 Costs -

(A) Reflected in GNP-PI
(B) Financed by Potential Reductions in National Average Wage Rate and Other Macroeconomic Effects
(C) To be Met by Other Sources

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	24%	50%	70%	0	1.5	0.2%	8.4%	91.3%
2%	24%	50%	70%	0.1	1.5	1.6%	7.4%	91.0%
2%	24%	50%	70%	0.2	1.5	2.8%	6.5%	90.7%
2%	24%	50%	70%	0.3	1.5	4.0%	5.6%	90.4%
2%	24%	50%	70%	0	3	0.4%	11.2%	88.4%
2%	24%	50%	70%	0.1	3	1.4%	10.4%	88.2%
2%	24%	50%	70%	0.2	3	2.4%	9.7%	88.0%
2%	24%	50%	70%	0.3	3	3.3%	9.0%	87.8%
2%	24%	64%	64%	0	1.5	0.3%	7.4%	92.4%
2%	24%	64%	64%	0.1	1.5	1.7%	6.3%	92.0%
2%	24%	64%	64%	0.2	1.5	3.1%	5.3%	91.7%
2%	24%	64%	64%	0.3	1.5	4.3%	4.3%	91.4%
2%	24%	64%	64%	0	3	0.5%	7.2%	92.3%
2%	24%	64%	64%	0.1	3	1.9%	6.1%	92.0%
2%	24%	64%	64%	0.2	3	3.2%	5.1%	91.6%
2%	24%	64%	64%	0.3	3	4.5%	4.2%	91.3%
2%	24%	78%	61%	0	1.5	0.3%	6.5%	93.3%
2%	24%	78%	61%	0.1	1.5	1.8%	5.3%	92.9%
2%	24%	78%	61%	0.2	1.5	3.3%	4.2%	92.5%
2%	24%	78%	61%	0.3	1.5	4.6%	3.2%	92.2%
2%	24%	78%	61%	0	3	0.5%	3.7%	95.8%
2%	24%	78%	61%	0.1	3	2.3%	2.3%	95.4%
2%	24%	78%	61%	0.2	3	4.0%	1.0%	95.0%
2%	24%	78%	61%	0.3	3	5.6%	-0.2%	94.6%
2%	32%	50%	74%	0	1.5	0.3%	11.3%	88.4%
2%	32%	50%	74%	0.1	1.5	2.1%	9.9%	88.0%

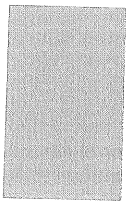
(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
2%	32%	50%	74%	0.2	1.5	3.7%	8.7%	87.6%
2%	32%	50%	74%	0.3	1.5	5.3%	7.5%	87.2%
2%	32%	50%	74%	0	3	0.5%	15.0%	84.5%
2%	32%	50%	74%	0.1	3	1.8%	14.0%	84.2%
2%	32%	50%	74%	0.2	3	3.1%	13.0%	83.9%
2%	32%	50%	74%	0.3	3	4.3%	12.0%	83.7%
2%	32%	64%	64%	0	1.5	0.3%	9.8%	89.8%
2%	32%	64%	64%	0.1	1.5	2.2%	8.4%	89.4%
2%	32%	64%	64%	0.2	1.5	4.0%	7.0%	88.9%
2%	32%	64%	64%	0.3	1.5	5.7%	5.8%	88.5%
2%	32%	64%	64%	0	3	0.6%	9.7%	89.8%
2%	32%	64%	64%	0.1	3	2.5%	8.2%	89.3%
2%	32%	64%	64%	0.2	3	4.3%	6.9%	88.9%
2%	32%	64%	64%	0.3	3	5.9%	5.6%	88.5%
2%	32%	78%	59%	0	1.5	0.3%	8.7%	91.0%
2%	32%	78%	59%	0.1	1.5	2.4%	7.1%	90.5%
2%	32%	78%	59%	0.2	1.5	4.3%	5.6%	90.1%
2%	32%	78%	59%	0.3	1.5	6.1%	4.3%	89.6%
2%	32%	78%	59%	0	3	0.6%	5.1%	94.3%
2%	32%	78%	59%	0.1	3	3.0%	3.3%	93.7%
2%	32%	78%	59%	0.2	3	5.2%	1.6%	93.2%
2%	32%	78%	59%	0.3	3	7.3%	-0.1%	92.7%
2%	40%	50%	79%	0	1.5	0.3%	14.2%	85.4%
2%	40%	50%	79%	0.1	1.5	2.5%	12.5%	84.9%
2%	40%	50%	79%	0.2	1.5	4.6%	10.9%	84.4%
2%	40%	50%	79%	0.3	1.5	6.6%	9.5%	84.0%
2%	40%	50%	79%	0	3	0.5%	18.9%	80.6%
2%	40%	50%	79%	0.1	3	2.2%	17.6%	80.2%
2%	40%	50%	79%	0.2	3	3.8%	16.3%	79.9%
2%	40%	50%	79%	0.3	3	5.3%	15.1%	79.6%
2%	40%	64%	64%	0	1.5	0.3%	12.3%	87.3%
2%	40%	64%	64%	0.1	1.5	2.8%	10.5%	86.7%
2%	40%	64%	64%	0.2	1.5	5.0%	8.8%	86.2%
2%	40%	64%	64%	0.3	1.5	7.1%	7.2%	85.7%
2%	40%	64%	64%	0	3	0.6%	12.1%	87.3%
2%	40%	64%	64%	0.1	3	3.0%	10.3%	86.7%
2%	40%	64%	64%	0.2	3	5.3%	8.6%	86.1%
2%	40%	64%	64%	0.3	3	7.4%	7.0%	85.6%
2%	40%	78%	57%	0	1.5	0.4%	10.9%	88.8%
2%	40%	78%	57%	0.1	1.5	2.9%	8.9%	88.1%
2%	40%	78%	57%	0.2	1.5	5.3%	7.1%	87.6%
2%	40%	78%	57%	0.3	1.5	7.6%	5.4%	87.0%
2%	40%	78%	57%	0	3	0.6%	6.8%	92.6%
2%	40%	78%	57%	0.1	3	3.6%	4.5%	92.0%
2%	40%	78%	57%	0.2	3	6.4%	2.3%	91.3%
2%	40%	78%	57%	0.3	3	9.0%	0.2%	90.8%
3%	24%	50%	70%	0	1.5	0.5%	12.5%	87.0%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	24%	50%	70%	0.1	1.5	2.5%	11.0%	86.5%
3%	24%	50%	70%	0.2	1.5	4.4%	9.5%	86.1%
3%	24%	50%	70%	0.3	1.5	6.1%	8.2%	85.7%
3%	24%	50%	70%	0	3	0.9%	16.5%	82.6%
3%	24%	50%	70%	0.1	3	2.4%	15.3%	82.3%
3%	24%	50%	70%	0.2	3	3.8%	14.2%	82.0%
3%	24%	50%	70%	0.3	3	5.1%	13.2%	81.7%
3%	24%	64%	64%	0	1.5	0.6%	10.9%	88.5%
3%	24%	64%	64%	0.1	1.5	2.7%	9.3%	88.0%
3%	24%	64%	64%	0.2	1.5	4.7%	7.7%	87.5%
3%	24%	64%	64%	0.3	1.5	6.6%	6.3%	87.1%
3%	24%	64%	64%	0	3	1.1%	10.5%	88.4%
3%	24%	64%	64%	0.1	3	3.2%	8.9%	87.9%
3%	24%	64%	64%	0.2	3	5.2%	7.4%	87.4%
3%	24%	64%	64%	0.3	3	7.0%	6.0%	87.0%
3%	24%	78%	61%	0	1.5	0.6%	9.5%	89.9%
3%	24%	78%	61%	0.1	1.5	2.9%	7.8%	89.3%
3%	24%	78%	61%	0.2	1.5	5.1%	6.1%	88.8%
3%	24%	78%	61%	0.3	1.5	7.1%	4.6%	88.3%
3%	24%	78%	61%	0	3	1.1%	5.2%	93.7%
3%	24%	78%	61%	0.1	3	3.8%	3.2%	93.0%
3%	24%	78%	61%	0.2	3	6.3%	1.3%	92.4%
3%	24%	78%	61%	0.3	3	8.6%	-0.5%	91.9%
3%	32%	50%	74%	0	1.5	0.6%	16.7%	82.6%
3%	32%	50%	74%	0.1	1.5	3.3%	14.7%	82.0%
3%	32%	50%	74%	0.2	1.5	5.8%	12.8%	81.4%
3%	32%	50%	74%	0.3	1.5	8.1%	11.0%	80.9%
3%	32%	50%	74%	0	3	1.0%	22.2%	76.8%
3%	32%	50%	74%	0.1	3	3.0%	20.6%	76.4%
3%	32%	50%	74%	0.2	3	4.9%	19.1%	76.0%
3%	32%	50%	74%	0.3	3	6.7%	17.7%	75.6%
3%	32%	64%	64%	0	1.5	0.7%	14.5%	84.8%
3%	32%	64%	64%	0.1	1.5	3.6%	12.4%	84.1%
3%	32%	64%	64%	0.2	1.5	6.2%	10.4%	83.4%
3%	32%	64%	64%	0.3	1.5	8.8%	8.5%	82.8%
3%	32%	64%	64%	0	3	1.3%	14.1%	84.6%
3%	32%	64%	64%	0.1	3	4.1%	12.0%	83.9%
3%	32%	64%	64%	0.2	3	6.7%	10.0%	83.3%
3%	32%	64%	64%	0.3	3	9.2%	8.1%	82.7%
3%	32%	78%	59%	0	1.5	0.7%	12.8%	86.5%
3%	32%	78%	59%	0.1	1.5	3.8%	10.4%	85.8%
3%	32%	78%	59%	0.2	1.5	6.7%	8.3%	85.1%
3%	32%	78%	59%	0.3	1.5	9.3%	6.2%	84.4%
3%	32%	78%	59%	0	3	1.3%	7.4%	91.4%
3%	32%	78%	59%	0.1	3	4.8%	4.6%	90.5%
3%	32%	78%	59%	0.2	3	8.2%	2.1%	89.8%
3%	32%	78%	59%	0.3	3	11.3%	-0.3%	89.1%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
3%	40%	50%	79%	0	1.5	0.7%	21.1%	78.2%
3%	40%	50%	79%	0.1	1.5	4.0%	18.6%	77.4%
3%	40%	50%	79%	0.2	1.5	7.1%	16.2%	76.7%
3%	40%	50%	79%	0.3	1.5	10.0%	14.0%	76.0%
3%	40%	50%	79%	0	3	1.1%	28.0%	70.9%
3%	40%	50%	79%	0.1	3	3.6%	25.9%	70.4%
3%	40%	50%	79%	0.2	3	6.0%	24.0%	70.0%
3%	40%	50%	79%	0.3	3	8.3%	22.2%	69.5%
3%	40%	64%	64%	0	1.5	0.8%	18.2%	81.0%
3%	40%	64%	64%	0.1	1.5	4.4%	15.5%	80.1%
3%	40%	64%	64%	0.2	1.5	7.7%	13.0%	79.3%
3%	40%	64%	64%	0.3	1.5	10.9%	10.6%	78.5%
3%	40%	64%	64%	0	3	1.4%	17.7%	80.9%
3%	40%	64%	64%	0.1	3	4.9%	15.1%	80.0%
3%	40%	64%	64%	0.2	3	8.3%	12.6%	79.2%
3%	40%	64%	64%	0.3	3	11.4%	10.2%	78.4%
3%	40%	78%	57%	0	1.5	0.8%	16.1%	83.2%
3%	40%	78%	57%	0.1	1.5	4.6%	13.2%	82.2%
3%	40%	78%	57%	0.2	1.5	8.2%	10.5%	81.4%
3%	40%	78%	57%	0.3	1.5	11.5%	7.9%	80.5%
3%	40%	78%	57%	0	3	1.4%	9.7%	88.9%
3%	40%	78%	57%	0.1	3	5.8%	6.3%	87.9%
3%	40%	78%	57%	0.2	3	9.9%	3.1%	87.0%
3%	40%	78%	57%	0.3	3	13.8%	0.1%	86.1%
4.5%	24%	50%	70%	0	1.5	1.1%	18.3%	80.6%
4.5%	24%	50%	70%	0.1	1.5	4.1%	16.1%	79.8%
4.5%	24%	50%	70%	0.2	1.5	6.9%	14.0%	79.2%
4.5%	24%	50%	70%	0.3	1.5	9.4%	12.0%	78.6%
4.5%	24%	50%	70%	0	3	1.9%	24.1%	74.0%
4.5%	24%	50%	70%	0.1	3	4.1%	22.4%	73.5%
4.5%	24%	50%	70%	0.2	3	6.2%	20.8%	73.0%
4.5%	24%	50%	70%	0.3	3	8.2%	19.2%	72.6%
4.5%	24%	64%	64%	0	1.5	1.3%	15.9%	82.8%
4.5%	24%	64%	64%	0.1	1.5	4.5%	13.5%	82.0%
4.5%	24%	64%	64%	0.2	1.5	7.4%	11.3%	81.3%
4.5%	24%	64%	64%	0.3	1.5	10.2%	9.2%	80.6%
4.5%	24%	64%	64%	0	3	2.3%	15.1%	82.6%
4.5%	24%	64%	64%	0.1	3	5.4%	12.8%	81.8%
4.5%	24%	64%	64%	0.2	3	8.4%	10.6%	81.1%
4.5%	24%	64%	64%	0.3	3	11.1%	8.5%	80.4%
4.5%	24%	78%	61%	0	1.5	1.4%	13.8%	84.8%
4.5%	24%	78%	61%	0.1	1.5	4.8%	11.3%	84.0%
4.5%	24%	78%	61%	0.2	1.5	8.0%	8.9%	83.2%
4.5%	24%	78%	61%	0.3	1.5	11.0%	6.6%	82.4%
4.5%	24%	78%	61%	0	3	2.5%	7.2%	90.3%
4.5%	24%	78%	61%	0.1	3	6.4%	4.2%	89.4%
4.5%	24%	78%	61%	0.2	3	10.1%	1.4%	88.5%

(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)
		Labor Cost as % Total Cost				% of Increm. SFAS 106 Costs		
% Chg. Labor Cost	% Empl. Subj to FAS 106	Subj to FAS 106	Not Subj	Labor Supply Elast.	Price Elast. Demand	Reflected in GNP-PI	Other Macroecon. Effects	To be met by Other Sources
4.5%	24%	78%	61%	0.3	3	13.6%	-1.2%	87.7%
4.5%	32%	50%	74%	0	1.5	1.4%	24.6%	74.0%
4.5%	32%	50%	74%	0.1	1.5	5.3%	21.6%	73.1%
4.5%	32%	50%	74%	0.2	1.5	9.0%	18.8%	72.2%
4.5%	32%	50%	74%	0.3	1.5	12.4%	16.2%	71.4%
4.5%	32%	50%	74%	0	3	2.2%	32.5%	65.3%
4.5%	32%	50%	74%	0.1	3	5.2%	30.1%	64.6%
4.5%	32%	50%	74%	0.2	3	8.0%	27.9%	64.1%
4.5%	32%	50%	74%	0.3	3	10.6%	25.9%	63.5%
4.5%	32%	64%	64%	0	1.5	1.5%	21.3%	77.2%
4.5%	32%	64%	64%	0.1	1.5	5.8%	18.1%	76.1%
4.5%	32%	64%	64%	0.2	1.5	9.8%	15.1%	75.1%
4.5%	32%	64%	64%	0.3	1.5	13.5%	12.3%	74.2%
4.5%	32%	64%	64%	0	3	2.8%	20.3%	76.9%
4.5%	32%	64%	64%	0.1	3	7.0%	17.2%	75.8%
4.5%	32%	64%	64%	0.2	3	10.9%	14.3%	74.9%
4.5%	32%	64%	64%	0.3	3	14.5%	11.5%	73.9%
4.5%	32%	78%	59%	0	1.5	1.6%	18.6%	79.8%
4.5%	32%	78%	59%	0.1	1.5	6.2%	15.2%	78.7%
4.5%	32%	78%	59%	0.2	1.5	10.4%	12.0%	77.6%
4.5%	32%	78%	59%	0.3	1.5	14.4%	9.0%	76.6%
4.5%	32%	78%	59%	0	3	2.8%	10.3%	86.9%
4.5%	32%	78%	59%	0.1	3	8.1%	6.3%	85.6%
4.5%	32%	78%	59%	0.2	3	13.0%	2.5%	84.5%
4.5%	32%	78%	59%	0.3	3	17.6%	-1.1%	83.4%
4.5%	40%	50%	79%	0	1.5	1.6%	31.0%	67.4%
4.5%	40%	50%	79%	0.1	1.5	6.5%	27.3%	66.3%
4.5%	40%	50%	79%	0.2	1.5	11.0%	23.8%	65.2%
4.5%	40%	50%	79%	0.3	1.5	15.3%	20.5%	64.2%
4.5%	40%	50%	79%	0	3	2.5%	41.0%	56.5%
4.5%	40%	50%	79%	0.1	3	6.2%	38.0%	55.8%
4.5%	40%	50%	79%	0.2	3	9.7%	35.2%	55.1%
4.5%	40%	50%	79%	0.3	3	13.0%	32.6%	54.4%
4.5%	40%	64%	64%	0	1.5	1.7%	26.7%	71.6%
4.5%	40%	64%	64%	0.1	1.5	7.0%	22.7%	70.3%
4.5%	40%	64%	64%	0.2	1.5	12.0%	19.0%	69.0%
4.5%	40%	64%	64%	0.3	1.5	16.7%	15.5%	67.9%
4.5%	40%	64%	64%	0	3	3.1%	25.7%	71.3%
4.5%	40%	64%	64%	0.1	3	8.3%	21.7%	69.9%
4.5%	40%	64%	64%	0.2	3	13.2%	18.0%	68.7%
4.5%	40%	64%	64%	0.3	3	17.8%	14.6%	67.6%
4.5%	40%	78%	57%	0	1.5	1.7%	23.5%	74.8%
4.5%	40%	78%	57%	0.1	1.5	7.4%	19.2%	73.4%
4.5%	40%	78%	57%	0.2	1.5	12.7%	15.2%	72.1%
4.5%	40%	78%	57%	0.3	1.5	17.7%	11.4%	70.8%
4.5%	40%	78%	57%	0	3	3.0%	13.7%	83.3%
4.5%	40%	78%	57%	0.1	3	9.5%	8.7%	81.8%
4.5%	40%	78%	57%	0.2	3	15.7%	3.9%	80.4%
4.5%	40%	78%	57%	0.3	3	21.5%	-0.5%	79.0%

Attachment G - 1992 Further Explanation of Macroeconomic Model



Additional Exposition of the Macroeconomic Model used in the Godwins Report

Andrew B. Abel

Part I of Appendix C in the Godwins Report contains a complete derivation of the macroeconomic model used in that report. Below is a list of the equations that must be satisfied by a solution to the model. The general model described in Appendix C applies to any number of sectors. Since the model is implemented as a two-sector model, the equations below are written without using summation notation.

(A4) $P = (\alpha_1^{\theta} P_1^{1-\theta} + \alpha_2^{\theta} P_2^{1-\theta})^{1/(1-\theta)}$

(A8) $P_1C_1 + P_2C_2 = (\gamma/(1-\gamma))M$

(A15) $N^* = \nu(w/P)^{\eta}$

(A16) $Y_i = A_i N_i^{\rho_i} K_i^{1-\rho_i}$ $\quad i = 1,2$

(A18) $\rho_i P_i Y_i / N_i = wD_i$ $\quad i = 1,2$

(A19) $(1-\rho_i) P_i Y_i / K_i = r$ $\quad i = 1,2$

(A20) $N_1 + N_2 = N^*$

(A21) $K_1 + K_2 = K^*$

(A22) $M = M^*$

(A23) $Y_i = \alpha_i^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma))M/P$ $\quad i = 1,2$

(A24) $P_1Y_1 + P_2Y_2 = rK^* + wD_1N_1 + wD_2N_2$

In addition, the solution must satisfy

$C_i = Y_i$ $\quad i = 1,2$

Part II of Appendix C of the Godwins Report describes the calibration of the model. An expanded version of Part II of Appendix C, which is written without summation notation and provides somewhat more detail than the version in the Godwins Report, is appended to the end of this document. Below are lists of input values of variables for (1) the initial calibration of the model; and (2) the calculation of the effect of SFAS 106.

Input variables for the initial calibration:

$\eta = 0.0$

$\theta = 1.5$

$\rho_1 = 0.64$

$\rho_2 = 0.64$

$D_1 = 1.0$

$D_2 = 1.0$

$s^N_1 = N_1/N^* = 0.68$ [used to determine s^Y_i from equation (B4), which is used to determine α_i from equation (B15)]

In addition, there are other inputs to the model that are simply normalizations. None of the important results of the model depends on the values of these inputs.

$\gamma = 0.25$

$N_o^* = 100$ [used to determine ν from equation (B9)]

$K^* = 100$

$A_1 = 1.0$

$P_1 = P_2 = P = 1.0$

Input variables with SFAS 106:

$\eta = 0.0$

$\theta = 1.5$

$\rho_1 = 0.64$

$\rho_2 = 0.64$

$D_1 = 1.0$

$D_2 = 1.03$

$\gamma = 0.25$

$\nu = 100$

$K^* = 100$

$A_1 = A_2 = 1.0$

$M^* = 300$

$\alpha_1^{\theta} = 0.68$

$\alpha_2^{\theta} = 0.32$ [Note that $\alpha_1^{\theta} + \alpha_2^{\theta} = 1$ as required by equation (B13)]

Below are lists of the values of the variables obtained by the model for: (1) the initial calibration of the model; and (2) the calculation of the effects of SFAS 106.

Results of initial calibration:

$N_1 = 68$

$N_2 = 32$

$K_1 = 68$

$K_2 = 32$

$Y_1 = 68$

$Y_2 = 32$

$w = 0.64$

$r = 0.36$

$\nu = 100$

$A_2 = 1.0$

$M^* = 300$

$N^* = 100$

$\alpha_1^{\theta} = 0.68$

$\alpha_2^{\theta} = 0.32$

Results of model with SFAS 106:

$N^* = 100$

$P_1 = 0.994063332$

$P_2 = 1.01304766$

$P = 1.00007984$

$N_1 = 68.8429959$

$N_2 = 31.1570041$

$K_1 = 68.2054725$

$K_2 = 31.7945275$

$Y_1 = C_1 = 68.6128039$

$Y_2 = C_2 = 31.3850263$

$w = 0.634073253$

$r = 0.36$

$M = 300$

private sector fixed-weight price index = 1.0001383
(sector 1 weight = 0.68; sector 2 weight = 0.32)

GNP-PI = 1.0001236
(private sector weight = 0.894; government sector weight = 0.106)

Although Appendix C of the Godwins Report provides derivations of equations, more detailed algebraic derivations are provided below for the following equations:

(a) equation (A10) on page 55
(b) equation (B4) on page 58
(c) equation (B5) on page 58

(a) derivation of (A10) on page 55:

Substituting (A9) into (A7) yields

(R1) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} (1-\gamma) I = (1-\gamma) P_i$

Divide both sides of (R1) by $1-\gamma$ to obtain

(R2) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} I = P_i$

Raise both sides of (R2) to the power $1-\theta$ to obtain

(R3) $\alpha_i^{1-\theta} C_i^{(\theta-1)/\theta} \gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta} = P_i^{1-\theta}$

Multiply both sides of (R3) by α_i^{θ} to obtain

(R4) $\alpha_i C_i^{(\theta-1)/\theta} \gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta} = \alpha_i^{\theta} P_i^{1-\theta}$

Observe from the definition of P in (A4) that

(R5) $P^{1-\theta} = \Sigma_i \alpha_i^{\theta} P_i^{1-\theta}$

Sum both sides of (R4) over i and use (R5) to simplify the right hand side of the resulting equation to obtain

(R6) $\gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta} \Sigma_i \alpha_i C_i^{(\theta-1)/\theta} = P^{1-\theta}$

Observe from the definition of C in (A3) that

(R7) $\Sigma_i \alpha_i C_i^{(\theta-1)/\theta} = C^{(\theta-1)/\theta}$

Substituting (R7) into (R6) yields

(R8) $\gamma^{1-\theta} I^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} C^{(\theta-1)/\theta} = P^{1-\theta}$

Raise both sides of (R8) to the power $1/(1-\theta)$ to obtain

(R9) $\gamma I C^{(1-\theta)/\theta} C^{-1/\theta} = P$

Simplfying the left hand side of (R9) yields

(R10) $\gamma I C^{-1} = P$

Multiplying both sides of (R10) by C yields

(A10) $\gamma I = PC$

(b) derivation of (B4) on page 58: The expanded version of the Appendix at the end of this document contains a more complete algebraic derivation of equation (B4) than is provided in the Godwins Report. This more complete derivation is reproduced below.

Define $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to be the share of total output that is produced in sector i. Multiply both sides of the labor demand equation (A18) by $N_i/(N^*\rho_i)$ to obtain

(B3') $P_iY_i/N^* = wN_iD_i/(N^*\rho_i)$ i = 1,2

Recall that $s^N_i = N_i/N^*$ so that (B3') becomes

(B3'') $P_iY_i/N^* = ws^N_iD_i/\rho_i$ i = 1,2

Now sum (B3'') over sectors 1 and 2 to obtain

(B3''') $(P_1Y_1 + P_2Y_2)/N^* = w(s^N_1D_1/\rho_1 + s^N_2D_2/\rho_2)$

Now divide (B3'') by (B3''') and use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to obtain

(B4) $s^Y_i = (D_is^N_i/\rho_i)/(D_1s^N_1/\rho_1 + D_2s^N_2/\rho_2)$ i = 1,2

(c) derivation of (B5) on page 58: The expanded version of the Appendix at the end of this document contains a more complete algebraic derivation of equation (B5) than is provided in the Godwins Report. This more complete derivation is reproduced below.

Multiply both sides of the capital demand equation (A19) by $K_i/(P_1Y_1 + P_2Y_2)$ and divide both sides by r to obtain

(B4') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)P_iY_i/((P_1Y_1 + P_2Y_2)r)$ i = 1,2

Use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to write (B4') as

(B4'') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)s^Y_i/r$ i = 1,2

Next sum (B4'') over sectors 1 and 2 and recall that $K_1 + K_2 = K^*$ to obtain

(B4''') $K^*/(P_1Y_1 + P_2Y_2) = [(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]/r$ i = 1,2

Divide (B4'') by (B4''') to obtain

(B4'''') $K_i/K^* = (1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]$ i = 1,2

Multiply both sides of (B4'''') by K^* to obtain

(B5) $K_i = ((1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2])\ K^*$ i = 1,2

The Godwins Report followed a conservative approach in calculating the impact of SFAS 106 on GNP-PI. The guiding principle of the conservative approach is that whenever a choice needs to be made about some variable or some assumption, we use the value of the variable or the assumption that overstates the impact of SFAS 106 on GNP-PI. By following this approach, we can be fairly confident that we have not understated the impact of SFAS 106 on GNP-PI.

The July 1992 Supplemental Report to the Godwins Report pointed to specific examples of choices governed by the conservative approach.[1] In addition, the conservative approach guided the assumptions about how firms and workers view future OPEB payments. One possibility for specifying the model was to assume that everyone in the economy, workers and firms alike, fully understands and takes account of future OPEB payments. In this case, compensation per worker, which includes the present value of future OPEB, would be equalized across sectors. However, in this case, the impact of SFAS 106 on GNP-PI would be precisely zero. Any increase in OPEB in sector 2 would be offset by a decrease in non-OPEB compensation in sector 2.

Rather than choose a set of assumptions that delivered a zero impact of SFAS 106 on GNP-PI, we chose a set of assumptions that would increase GNP-PI, in order to implement a conservative approach. In order for an increase in OPEB not to be offset by a decrease in wages, the firms and/or the workers must not take account of the increase in OPEB. It seemed that the most realistic approach is to assume that (1) after the introduction of SFAS 106 firms fully recognize future OPEB costs as part of total compensation paid to current workers; but (2) workers do not take account of future OPEB benefits (which for the average worker may be more than two decades in the future) in making their labor supply decisions.

One consequence of the assumption that workers ignore future OPEB benefits is that the total compensation package per worker, including OPEB, is higher in sector 2 than in sector 1. However, wages and fringes, excluding OPEB, are equalized across both sectors. A second consequence of this assumption is that the wage rate in sector 2 does not fall as much as it would otherwise, and thus the price level under SFAS 106 is higher than if we had assumed that everyone takes account of future OPEB payments. Therefore, this assumption helps to implement the conservative approach of guarding against understating the impact of SFAS 106 on GNP-PI.

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[1] Specific examples of choices governed by this conservative approach are listed for the actuarial analysis in footnote 4, p. 16 and for the macroeconomic analysis on page 32 of the July 1992 Supplemental Report to the Godwins Report.

Expanded version of
"Appendix C, Part II: Calibration of the Model"

[Note: The equations are numbered so that equations that appeared in the original version of the appendix have the same numbers in this version. New equations are numbered with one or more apostrophes or asterisks.]

The model is calibrated so that in the absence of SFAS 106 it yields an allocation of labor across sectors that matches the actual allocation of labor across sectors. It is also calibrated such that in the absence of SFAS 106, all nominal prices are equal to one.

The inputs to the model are:

η, the elasticity of labor supply

θ, the elasticity of substitution between the consumption of any two goods

ρ_1, the share of labor in total cost in sector 1

ρ_2, the share of labor in total cost in sector 2

D_2, the SFAS 106 cost factor in sector 2 (equal to 1 in the absence of SFAS 106)

$s^N_1 = N_1/N^*$, the fraction of labor employed in sector 1

In addition, there are three other inputs to the model that are simply normalizations. None of the important results of the model depends on the value of these inputs.

γ, the share of nominal expenditure devoted to produced goods

N_o^*, the initial total amount of labor

K*, the fixed total amount of capital

In the absense of SFAS 106, all nominal prices are set equal to one

(B1) $P_i = 1$ $\qquad i = 1,2$

(B2) $P = 1$

The amount of labor initially used in each sector follows directly from the fraction of the labor force employed in sector i, s^N_i, and the total amount of labor employed, N_o^*

(B3) $N_i = s^N_i \, N_o^*$ $\qquad i = 1,2$

Define $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to be the share of total output that is produced in sector i. Multiply both sides of the labor demand equation (A18) by $N_i/(N^*\rho_i)$ to obtain

(B3') $P_iY_i/N^* = wN_iD_i/(N^*\rho_i)$ i = 1,2

Recall that $s^N_i = N_i/N^*$ so that (B3') becomes

(B3'') $P_iY_i/N^* = ws^N_iD_i/\rho_i$ i = 1,2

Now sum (B3'') over sectors 1 and 2 to obtain

(B3''') $(P_1Y_1 + P_2Y_2)/N^* = w(s^N_1D_1/\rho_1 + s^N_2D_2/\rho_2)$

Now divide (B3'') by (B3''') and use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to obtain

(B4) $s^Y_i = (D_is^N_i/\rho_i)/(D_1s^N_1/\rho_1 + D_2s^N_2/\rho_2)$ i = 1,2

Recall that in the initial equilibrium $D_i = 1$ so that (B4) becomes

(B4*) $s^Y_i = (s^N_i/\rho_i)/(s^N_1/\rho_1 + s^N_2/\rho_2)$ i = 1,2

Multiply both sides of the capital demand equation (A19) by $K_i/(P_1Y_1 + P_2Y_2)$ and divide both sides by r to obtain

(B4') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)P_iY_i/((P_1Y_1 + P_2Y_2)r)$ i = 1,2

Use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to write (B4') as

(B4'') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)s^Y_i/r$ i = 1,2

Next sum (B4'') over sectors 1 and 2 and recall that $K_1 + K_2 = K^*$ to obtain

(B4''') $K^*/(P_1Y_1 + P_2Y_2) = [(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]/r$ i = 1,2

Divide (B4'') by (B4''') to obtain

(B4'''') $K_i/K^* = (1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]$ i = 1,2

Multiply both sides of (B4'''') by K^* to obtain

(B5) $K_i = ((1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2])\ K^*$ i = 1,2

Normalize $A_1 = 1$ so that the production function in the first sector is

(B6) $Y_1 = N_1^{\rho_1} K_1^{1-\rho_1}$

Using Y_1 from (B6), the nominal wage can be determined from the labor demand equation (A18) for sector 1 to obtain

(B7) $w = \rho_1 Y_1 P_1/(D_1 N_1)$

Recall that in the initial equilibrium $P_1 = 1$ and $D_1 = 1$ so that

(B7') $w = \rho_1 Y_1/N_1$

Using Y_1 from (B6), the nominal rental price of capital can be determined from the capital demand equation (A19) for sector 1 to obtain

(B8) $r = (1-\rho_1) Y_1 P_1/K_1$

Recall that in the initial equilibrium $P_1 = 1$ so that

(B8') $r = (1-\rho_1) Y_1/K_1$

Now calculate ν in the labor supply curve (eq. A15) as

(B9) $\nu = N_o^*(P/w)^{\eta}$

Recall that $P = 1$ in the initial equilibrium so that

(B9') $\nu = N_o^*(1/w)^{\eta}$

To calibrate A_2, substitute the production function (A16) into the labor demand equation (A18) and set $P_i = 1$ (eq. B1) to obtain

(B10) $A_2 = (D_2 w/\rho_2)(N_2/K_2)^{1-\rho_2}$

Recall that $D_2 = 1$ in the initial equilibrium so that

(B10') $A_2 = (w/\rho_2)(N_2/K_2)^{1-\rho_2}$

Now set all prices equal to 1 in the equilibrium condition (A23), and use (A22) to obtain

(B11) $Y_i = \alpha_i^{\theta}(\gamma/(1-\gamma))M^*$

Summing (B11) over i we obtain

(B12) $Y_1 + Y_2 = (\gamma/(1-\gamma))M^* (\alpha_1^{\theta} + \alpha_2^{\theta})$

Now observe that with $P = P_i = 1$ for all i, equation (A4) implies that

(B13) $\alpha_1^{\theta} + \alpha_2^{\theta} = 1$

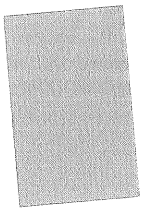
Substituting (B13) into (B12) and rearranging yields

(B14) $M^* = ((1-\gamma)/\gamma)\ [Y_1 + Y_2]$

Finally, substituting (B14) into (B11) and recalling that when $P_i = P = 1$, $s^Y_i = Y_i/[Y_1 + Y_2]$, we obtain

(B15) $\alpha_i^{\theta} = s^Y_i \quad i = 1,2$

Attachment H - USTA ex parte letter



EX PARTE

United States Telephone Association

900 19th Street, N.W., Suite 800
Washington, D.C. 20006-2105
(202) 835-3100

January 14, 1993

Chairman Alfred C. Sikes
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: CC Docket No. 92-101

Dear Chairman Sikes:

Over the past several weeks, MCI has circulated a number of different ex parte letters seeking to influence the application of the Commission's rules to SFAS 106 exogenous treatment by price cap exchange carriers (LECs). Because we find significant errors or incorrect representations in these letters, USTA is filing this written response, which covers all of the recent MCI ex parte letters of which we have become aware.

There are myriad claims that are included in the letters. Most are not directly related to this proceeding at all, but appear to be included simply to amplify the few direct arguments MCI is restating.

The single claim that runs through each letter is that, because postretirement benefits themselves "were incurred by the LECs as a result of decisions made during wage negotiations," the adoption of SFAS 106 and its ramifications therefore could not constitute an exogenous event.[1] MCI claims that exogenous treatment is not merited because MCI has concluded that benefit levels themselves were under the carrier's control. MCI misunderstands or simply misstates the issue. The central issue here is the fact that carriers have been mandated to change their method of accounting for OPEBs, and that the new accounting requirement forces OPEBs costs to be recognized on a different basis. It is the mandated accounting change that is the exogenous event. The price cap LECs had no control over the event which has required them to implement accrual accounting for OPEBs. The Financial Accounting Standards Board (FASB) and the Commission have made SFAS 106 mandatory.

MCI also incorrectly states that the accounting change is focused primarily on future costs, stating: "what has changed is the method of recognizing future costs."[2] MCI also implies that SFAS 106 has not changed actual costs. These statements are deceptively

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[1] See, e.g., MCI ex parte, January 6, 1992, from D. Evans at 1.

[2] See MCI ex parte, January 6, 1993, from D. Evans at 1.

incomplete. SFAS 106 costs are real costs of doing business that have been incurred by the carriers, and represent cash obligations that SFAS 106 now requires be recognized.

Just as the Commission has concluded in other contexts that current ratepayer costs should not be paid by future ratepayer groups, SFAS 106 requires that current costs of providing OPEBs be recognized in the current period, rather than delayed. The preexisting rule provided for a pay-as-you-go arrangement, whereby a carrier would recognize expenses actually incurred in previous periods only at the time they are paid. The FASB and the Commission have already concluded that this failed to reflect the true economic cost of OPEBs. The Commission has adopted SFAS 106 accounting.

Under preexisting accounting rules and rate of return regulatory constraints, the price cap LECs' OPEBs costs were postponed into the future, significantly understating the true cost of OPEBs. This resulted in prices to customers that were lower than required to cover the benefit obligations to employees working for the carriers at that time. Of course, SFAS 106 provides for ongoing recognition of costs as they are incurred. However, it also requires prior costs already incurred be recognized, causing real financial impacts now. SFAS 106 is being implemented across the business spectrum; there is no special consideration that could prevent LECs from doing the same. MCI and others who are outside comprehensive regulation have wide discretion to recover the true cost of OPEBs on a continuing basis in the prices they set. In contrast, the LECs under rate of return regulation and pay-as-you-go accounting for OPEBs had prices established using amounts below the actual cost of OPEBs; the prices of service now are simply being reconciled as these costs are taken into account under SFAS 106. Exogenous treatment of OPEBs cost that now should be recognized would not necessarily lead to an increase in revenue. Each price cap LEC must address its own price and market constraints.

MCI incorrectly asserts that the price cap LECs are requesting "relief from the very method of regulation that they advocated."[3] Actually, it is MCI which seeks to revise the rules to force OPEBs into the endogenous category of costs. That is why it has made its arguments here, however thin they are. The price cap rules and orders establish criteria for exogenous treatment. The price cap LECs contend that the handling of OPEBs as exogenous is a straightforward application of those Commission directives.

Certainly, the FASB had OPEBs accounting under consideration for an extended period of time. USTA and the price cap LECs were aware that accrual accounting for OPEBs could be required at some point. They argued to the Commission that exogenous treatment of accounting changes was an essential element of a fair regulatory plan. The

[3] See MCI ex parte, December 17, 1992, from D. Akerson at 1.

Commission concluded in adopting the price cap rules that "recognition of changing costs in adjustments to price caps is necessary to ensure that rates are not unreasonable from both a carrier's and the ratepayer's perspective."[4] Part 61.45 (d)(1) of the Commission's Rules allows for exogenous treatment of accounting changes as the Commission shall permit or require, and its Rules also provide for tariffs to address them when the changes are introduced. Thus, the price cap LECs are not requesting a change in price cap rules. In contrast, MCI apparently wants a redefinition of the exogenous cost mechanism so it will recognize only reductions in price cap indexes. The existing Commission Rules, however, contemplate both increases and decreases to price cap indexes. MCI bears a heavy burden to show that a new rule should be adopted to disallow costs that FASB 106 and the USOA require be recognized by the price cap LECs now.

MCI incorrectly suggests that "if the Commission allows exogenous treatment of post retirement benefits because the 'full' impact on each individual LEC is not reflected immediately in GNP-PI," the Commission must unbundle the entire GNP-PI.[5] MCI misunderstands the Commission's rationale for using GNP-PI inflation as an adjustment to the price cap indexes (and also the LECs' examination of GNP-PI in this docket.)[6] Growth in GNP-PI represents general inflation in the U.S. economy. It is used in the price cap framework because the prices of normal inputs used by carriers rise with the overall inflation rate. GNP-PI was selected by the Commission because it is a broad and conservative measure of inflation that could be expected to adequately reflect it in the price cap formula. The Commission recognized that GNP-PI would not capture all events affecting the prices of carriers' inputs; the exogenous cost framework exists in part to deal with these other effects. SFAS 106 costs are not accommodated in the normal GNP-PI framework. MCI is stretching for offsetting adjustments in claiming that LECs do not purchase certain goods or services that are reflected in GNP-PI. MCI provides no basis for reevaluating specific parts of GNP-PI within the context of the price cap formula.

Finally, MCI incorrectly implies that the LECs should record the difference between SFAS 106 costs and pay-as-you-go costs as a regulatory asset. The Commission must reject this demand. The Commission has already ordered SFAS 106 costs be reflected on

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[4] Further Notice, CC Docket No. 87-313, at ¶ 336.

[5] See MCI ex parte, January 6, 1993, from D. Evans at 2.

[6] It was in response to specific Commission orders that the price cap LECs undertook an examination of the GNP-PI to determine the extent, if any, of a possible double-counting of the exogenous recovery using the existing price cap mechanism. See, for example, Order on Reconsideration, CC Docket No. 87-313, released April 17, 1991, at ¶ 63; and Order of Investigation and Suspension, CC Docket No. 92-101, released April 30, 1992, at ¶¶ 11, 15 and 16.

the income statement, not recorded as a regulatory asset. Also, the Emerging Issues Task Force (EITF) of the FASB has already concluded that unless a regulator provides future revenue at least equal to the deferred cost (regulatory asset), the establishment of a regulatory asset will not be allowed.[7] This MCI suggestion contradicts generally accepted accounting principles.

The other claims that appear in the MCI letters repeat themes that appear in MCI filings in other proceedings, but that are essentially irrelevant here. MCI attempts to leverage claims that LECs face less competition, suggestions to take the expenses below the line, and requests for a broad access price review, all without substantiation, presumably to obtain offsetting cost reductions. The Commission has already concluded that SFAS 106 accounting is consistent with the Commission's regulatory accounting needs.[8] MCI's other demands contain no facts that are germane to exogenous treatment of SFAS 106 costs.

We believe these late MCI arguments are meritless. If there are any questions on this issue, we would be happy to respond. Two copies of this written ex parte response are being filed with the Secretary today for filing in the docket file of this proceeding.

Respectfully submitted,

Martin T. McCue

ccs: Commissioners
Commissioner Legal Assistants
Cheryl Tritt, Chief, Common Carrier Bureau
Greg Vogt, Chief, Tariff Division
Mary Brown

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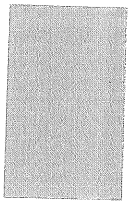
[7] Minutes of the November 19, 1992 EITF Meeting at 3. EITF minutes are a matter of public record. The EITF established other requirements before a regulatory asset could be established, including: annual SFAS 106 costs (including the TBO) should be included in rates within five years of adoption of SFAS 106; and the combined deferral/recovery period should not exceed approximately 20 years.

[8] Order, AAD 91-80, released December 26, 1991. "After reviewing SFAS-106, we have concluded that adoption for accounting purposes will not conflict with the Commission's regulatory objectives." at ¶ 3. Also, RAO Letter 20, released May 4, 1992, dictates how carriers account for SFAS 106.

Attachment I - NERA Study (April 15, 1992)



THE TREATMENT OF FAS 106 ACCOUNTING CHANGES UNDER FCC PRICE CAP REGULATION

Prepared for

Pacific Bell

National Economic Research Associates, Inc.
One Main Street
Cambridge, Massachusetts 02142

William E. Taylor and Timothy J. Tardiff
Study Directors

April 15, 1992

nera

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THE TREATMENT OF FAS 106 ACCOUNTING CHANGES UNDER FCC PRICE CAP REGULATION

I. INTRODUCTION AND SUMMARY

Under the theory of price cap regulation, changes in costs that are beyond the control of the firm (so-called "exogenous cost changes") are accorded special treatment. In general, changes in a regulated firm's costs should lead to changes in its prices because economic efficiency is enhanced when prices are kept close to (incremental) costs. However, the direct pass-through of all cost changes as price changes--as is done under traditional rate of return regulation--removes incentives the firm might have to control cost changes in the first place. Thus, price cap regulation permits only exogenous cost changes to affect the price cap. Incentives are preserved, and price changes follow cost changes to the greatest extent possible.

Pacific Bell is required to adopt a particular set of accounting changes--FAS 106 (Employers' Accounting For Postretirement Benefits Other Than Pensions)--no later than 1993. These changes were recently enacted by the Financial Accounting Standards Board (FASB) and have been adopted by the FCC.[1] Pacific is seeking recovery of the associated cost increase through a one-time Z-adjustment to its price cap to reflect (i) the amortization over 15 years of the historical liability for these benefits, and (ii) the shift from cash to accrual accounting for these benefits on a going-forward basis. Future changes in postretirement expenses would have no future effect on

[1]Federal Communications Commission, "Notification of Intent to Adopt Statement of Financial Accounting Standards No. 106, Employers' Accounting for Postretirement Benefits Other Than Pensions," AAD 91-80, December 1991.

Pacific's price cap, except that there would be an offsetting Z-adjustment after 15 years when the historical liability is entirely amortized.

We have been asked to determine whether--and to what extent--FAS 106 accounting qualifies for treatment as an exogenous cost change under the price cap plan promulgated for the interstate services of Tier 1 local exchange telephone companies (LECs). To answer this question, we must examine three economic issues. First, adoption of FAS 106 leads to a change in accounting costs. In what sense does this change represent a change in costs that should be reflected in a regulated firm's price cap? Second, is this change in costs beyond the control of a regulated firm so that its efficiency incentives would not be diminished if the cost change were passed through in prices? Finally, what portion of this change in costs will be automatically recovered through an increase in the rate of inflation and what portion remains to be recovered through an exogenous cost change to the firm's price cap?

Our conclusions support exogenous cost treatment for FAS 106 cost changes. First, we find that adoption of accrual accounting for postretirement benefits represents an accounting recognition of proper economic costs. Prices under price caps were initially set using cash accounting for postretirement benefits. Thus a change in the price cap is necessary so that prices will reflect the economic cost of service. Second, adoption of FAS 106 accounting by the FASB and by the FCC is certainly beyond the control of the regulated firm. Moreover, a one-time adjustment to its prices to reflect the economic costs of postretirement benefits does not reduce the firm's incentive to control expenditures on those benefits. Third, because prices in unregulated markets already reflect the economic costs of postretirement benefits, adoption of FAS 106 will

not cause them to change. Hence the effect of FAS 106 on output prices is confined to the regulated sector, and we estimate its effect on the rate of growth of GNP-PI to be less than 0.12 percent per year.

II. BACKGROUND

In December 1990, the FASB issued a formal statement, "Statement of Financial Accounting Standards No. 106" (FAS 106), acknowledging that the provision of other post-employment benefits (OPEBs) is a form of deferred compensation and that accounting for OPEBs should be changed from a cash to an accrual basis. Cash accounting, which recognizes OPEB costs only when they are paid to retirees, understates current costs and overstates future costs of employing any individual worker. If the prices of a regulated firm are set to recover book costs, cash accounting for OPEBs can lead to an intertemporal subsidy in which current ratepayers pay less than the true cost of service and future ratepayers pay more.

Implementation of accrual accounting for OPEBs in 1993 means that going forward, the OPEB liability will be recognized on the books of the company when the liability is incurred (i.e., while the employee is working and qualifying for the benefit) rather than when the liability is actually paid (after the employee retires and receives medical, dental, or life insurance benefits covered by the plan).[2] This liability will have several components. First, companies must account for the actuarial present value

[2]In addition, FAS 106 requires that the unrecognized accumulated liability to active and retired workers for OPEBs be recognized either in 1993 or amortized over an acceptable time period.

of future OPEBs that are associated with employees hired prior to 1993. For many companies, this liability is a large fraction of their net worth; thus FAS 106 permits companies to amortize this liability over a period not to exceed 20 years. Second, companies must recognize the expected present value of OPEBs to which active employees become entitled in a given year. Annual interest on the entire OPEB obligation is an additional expense to be recognized under accrual accounting for OPEBs. Finally, accrued costs are reduced by the actual return on qualified plan assets.

This change in accounting costs for OPEBs raises the following regulatory question: With the adoption of FAS 106 by the FCC, what is the appropriate regulatory treatment under the price cap plan of the change to accrual accounting for OPEBs?

III. THE THEORETICAL BASIS FOR EXOGENOUS COST TREATMENT

In this section, we show how a Z-adjustment should be calculated in the price cap formula given that the firm has experienced an exogenous change in costs for which Z treatment is appropriate. To understand how Z should be measured, we must understand where the annual price cap adjustment formula comes from and what it is supposed to accomplish.

The purpose of the annual price cap adjustment is to insure that if the regulated firm meets its productivity growth objective, its adjusted revenues will just track its costs every year, whatever the level of inflation happens to be. In the FCC

price cap plan for Tier 1 LECs, we fix a productivity target X, annually observe inflation measured by GNP-PI, and calculate Z-adjustments whenever appropriate so that if the productivity objective is met, the allowed change in the regulated firm's price will be close to its change in costs. Thus, our explanation begins with the total factor productivity (TFP) growth objective for the regulated firm, *dTFP*, which represents the annual year-over-year percentage growth in the regulated firm's TFP. From the productivity growth target and the objective of having revenues track costs, we derive below the annual price cap adjustment formula used in the FCC price cap plan. Once we know how the variables GNP-PI, X, and Z in the plan are derived and what they are supposed to measure, we can interpret them in the context of FAS 106 accounting changes.

A. Price Cap Theory[3]

A basic identity in economic theory states that the rate of growth of TFP is equal to the difference between the rates of growth of the firm's input prices and output prices.[4] Applying this rule to the regulated telecommunications firm, we write

$$dp^{\circ} = dw - dTFP$$

where dp° represents the annual percentage change in the telecommunications firm's output prices, and dw represents the annual percentage change in its input prices. To

[3]The price cap plan for Tier 1 LECs includes a factor that accounts for non-traffic sensitive costs. We ignore this term in our discussion, since it is not part of the theoretical basis for price caps.

[4]We show this formally in the Appendix.

raise or lower the firm's output price in order to track exogenous changes in cost, we write

(1) $$dp = dw - dTFP + Z^*$$

where dp represents the annual percentage change in the telecommunications firm's output prices adjusted for exogenous cost changes, and Z^* represents the unit change in costs due to external circumstances.[5] Thus, to keep the revenues of a price cap regulated firm equal to its costs despite inflation, the price cap formula should (i) increase the firm's output prices at the same rate as its input prices less the target change in productivity growth, and (ii) directly pass through exogenous cost changes.

Equation (1) looks a great deal like the annual adjustment equation in the FCC price cap plan: the allowed price change for the firm is set at a measure of its input price change less its TFP growth adjusted for exogenous cost pass-throughs. If GNP-PI were taken as a measure of the firm's input price growth and X were the firm's TFP growth target, equation (1) would indeed be the same as the price adjustment formula (apart for the adjustment for nontraffic sensitive costs). However, there are two errors in this interpretation:

1. The GNP-PI is a measure of national output price growth, not input price growth. So even if the regulated firm is a microcosm of U.S. industry, GNP-PI is not an appropriate measure of its input price growth.[6]

2. X in the price cap plan is a target TFP growth rate for the regulated firm relative to U.S. industry as a whole (or

[5]Note that Z^* can be positive or negative.

[6]Recall that input price growth differs from output price growth by the growth in TFP. Only if $DTFP^N$ were 0 could GNP-PI be a good measure of national input price growth.

relative to the TFP growth already embodied in the GNP-PI). The change in TFP in equation (1) is the absolute TFP growth for the regulated firm. Again, unless U.S. TFP growth is 0, X is not equal to $dTFP$.

To get from equation (1) to the price adjustment formula, we must compare the productivity growth of the regulated firm with the productivity growth of the U.S. economy. The reason for this comparison is that it is difficult to measure input price growth objectively. In particular, no competent party outside of the industry, such as the Bureau of Labor Statistics or the American Productivity Center, maintains an index of telecommunications input prices. However, by comparing productivity growth of the firm with that of the U.S. economy, the difficult measurement of input price growth can be avoided.

For the U.S. economy as a whole, the existence of effective competition implies that there are no long run excess profits, so the relationship among input prices, output prices, productivity, and exogenous cost changes can be derived for the nation as a whole in the same manner as it was derived in equation (1) above:

$$dp^N = dw^N - dTFP^N + Z^{*N} \tag{2}$$

where dp^N is the annual percentage change in a national index of output prices; dw^N is the annual percentage change in a national index of input prices; $dTFP^N$ is the annual change in the economy-wide total factor productivity, and Z^{*N} represents the change in national output prices caused by the exogenous factors included in equation (1). If we subtract equation (2) from equation (1), we see that

$$dp - dp^N = [dw - dw^N] - [dTFP - dTFP^N] + [Z^* - Z^{*N}].$$

or

$$(3) \qquad dp = dp^N - [\, dTFP - dTFP^N + dw^N - dw \,] + [\, Z^* - Z^{*N} \,].$$

Equation (3) is the theoretical equivalent of the price adjustment formula. The allowed price change for the regulated firm for a particular year is given by:

1. the rate of inflation of national output prices dp^N, (GNP-PI),
2. less a fixed productivity offset, X, which represents a target productivity growth differential between the regulated firm and the U.S. economy,[7]
3. plus unit exogenous cost changes, written as the difference in the unit costs of the exogenous change between the regulated firm and the U.S. economy.

Simple algebra translates equation (3) into the formula that appears in the price cap plan (again, apart for : adjustment for non-traffic sensitive costs):[8]

$$(4) \qquad R_t = R_{t-1} \times [\, 1 + GNP\text{-}PI - X \,] + Z$$

where R_t represents the regulated firm's revenue in year t using base period quantities.

In words, the change in the regulated firm's output price that will just track the change in its costs, whatever the level of inflation, is equal to (i) the change in a national index of output prices, less (ii) the difference between the change in total factor productivity for the telecommunications firm and for the nation as a whole,[9]

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[7]This differential is equal to the difference between the firm and U.S. TFP growth rates only if the rates of input price growth are the same for the firm and the nation: i.e., if $dw = dw^N$. Evidence supporting this assumption was presented by Dr. Laurits Christensen in Appendix F of AT&T's Comments in response to the FCC's Notice of Proposed Rulemaking in CC Docket 87-313, filed October 19, 1987. According to Dr. Christensen's calculations, input cost inflation for the Bell System and for the total U.S. private domestic economy averaged 4.5% and 4.6% respectively for the years 1948 through 1979.

[8]The equivalence of equations (3) and (4) are shown in the Appendix to this paper.

[9]Adjusted for possible differences between input price growth rates for the firm and the nation.

plus (iii) the difference between the effect of exogenous changes on the costs of the telephone firm and on the costs of the nation as a whole. This equation is the foundation of the price adjustment formula in the FCC price cap plan. In this plan, GNP-PI and Z are measured annually, but X is fixed as the target amount by which the firm's TFP growth should exceed U.S. TFP growth. If the firm exceeds its productivity target, revenue growth will exceed cost growth and the firm will make higher profits. If the firm falls short of its productivity target, revenue growth will fall short of cost growth and profits will fall.

B. Accounting Cost Changes in the Price Cap Formula

Changes in the method of accounting for OPEBs will result in large changes in accounting costs. However, accounting costs are different in principle from economic costs. In this section, we examine the effects of a change in accounting costs (such as the adoption of accrual accounting) on firms in competitive markets and on regulated firms.

The single most critical economic fact in this case is that costs recognized under FAS 106 accrual accounting for OPEBs reflect economic costs. Costs recognized under cash accounting for OPEBs do not.[10] Two important consequences follow from this fact. First, in unregulated markets, prices already reflect the economic costs of

[10]Accrual accounting for OPEBs estimates the present value of the liability for current services rendered by an employee in a given year. To measure the labor component of incremental cost (for a service), one would calculate the increase in person-hours (for different types of labor) caused by a hypothetical increase in demand. Each additional person-hour would add, to the total cost of the firm, an amount equal to the sum of wages and benefits. The cost of additional benefits to the firm caused by the additional person-hour is the present value of the liability that the firm expects to pay at some later date. That present value is the cost estimated by accrual accounting methods.

OPEBs, and the change from cash to accrual accounting will have no effect on prices in those markets. Second, in regulated markets where prices are based on accounting costs, prices do not reflect accrual accounting for OPEBs, and thus do not reflect economic costs for services. When adopted for ratemaking purposes, the change from cash to accrual accounting in regulated markets would move prices towards economic costs and would remove the intergenerational inequities embodied in the current price structure.

1. Utility Prices Should Reflect Economic Costs

There is general agreement among economists and regulators that public utility prices should be based, to the extent possible, on economic costs. To an economist, such prices are desirable because they promote economic efficiency. To a regulator, cost-based prices tend to be just and reasonable because they insure that customers pay their own way, in the sense of paying at least as much for the additional service they demand as it costs to produce that additional service. Previous FCC actions (e.g., the transition towards flat-rate recovery of interstate non-traffic sensitive costs) are consistent with this pricing objective.

Moving current prices towards current costs increases efficiency and reduces an intergenerational inequity. This inequity stems from regulatory practices that inappropriately defer cost recovery into the future, reducing current prices below current economic costs while raising future prices above future economic costs. Such practices include cash accounting for pensions or OPEBs, and the use of overly long depreciation lives instead of economic depreciation lives for capital recovery. The

resulting prices are inequitable because future ratepayers are burdened with the cost of services consumed by current ratepayers. They are also inefficient because (i) ratepayers never face proper incentives for choosing among services, and (ii) utilities never face the same costs of providing OPEBs as unregulated firms.

Under the FCC price cap plan, the initial rates are taken to be just and reasonable. The FCC observed in its Second Report and Order, CC Docket 87-313, (October 4, 1990):

> "...LEC interstate access rates, as they existed on July 1, 1990 and were adjusted by an Erratum, [footnote deleted] are the most reasonable basis from which to launch a system of price cap regulation," p. 97.

These initial rates reflect cash accounting for OPEBs. Thus, the price cap index must be adjusted to align prices under price caps with economic costs.

2. Accrual Accounting Costs for OPEBs Are Economic Costs

The economic costs of hiring an additional worker are given by the sum of wages paid and the present value of expected pension and OPEB expenses for that worker. OPEB expenses measured under cash accounting are of no use to a manager trying to decide how many workers to hire or what mixture of salary and benefits to offer. They are irrelevant because expenses for OPEBs under cash accounting are determined by the medical experiences of people who are not currently working. In unregulated markets, managers hire workers until the value of the additional output of the last worker just equals the additional cost of hiring that worker. The cost of hiring a worker is the sum of the costs of wages, pensions, and OPEBs. Competitive

pressures prevent managers from treating the costs of pensions and OPEBs as anything other than the present value of the expected cost of that benefit.

3. Prices in Unregulated Markets Reflect Accrual Accounting for OPEBs

In economic theory, a firm that used cash accounting for OPEBs in making decisions could not survive in competitive markets. Today--when cash accounting costs for OPEB are low--the firm would hire too much labor, include too large a component of OPEBs in its compensation offers to prospective employees, and price its products below their profit-maximizing levels. In the future--when cash accounting costs for OPEBs are high--the firm would hire too little labor, include too small an OPEB component in its compensation mix, and price its product above the true profit-maximizing level. As competitive forces move prices towards incremental cost, prices could no longer reflect cash accounting for OPEBs.

Even in unregulated but non-competitive markets, output prices would still reflect accrual accounting for OPEBs rather than cash accounting. An unregulated monopolist that used cash accounting for OPEBs in making decisions would also hire the wrong amount of labor, offer an inefficient mix of wages and benefits, and price its product incorrectly. If unregulated monopolists manage their affairs so as to maximize economic profits, their input decisions and output prices will reflect accrual accounting for OPEBs. Thus a change in accounting standards from cash accounting to accrual accounting for OPEBs should not change prices in unregulated markets, irrespective of the degree of competition in those markets.

Empirically, there is abundant evidence showing that shifts in accounting standards have negligible effects on firms in unregulated markets. A search of the empirical literature (see Section IV) examining the effects of the 1987 FASB change in the method of accrual accounting for pension benefits revealed no evidence linking stock prices and pension accounting changes. Thus in unregulated markets, additional OPEB accounting costs have been recognized by the corporations in prices and by financial analysts as a liability of the firm. The accounting recognition of these costs, therefore, has no impact on the financial situation of the firms. Accounting costs, however, have determined prices for regulated firms, from which we conclude that OPEB expenses are currently (before adoption of FAS 106) treated differently for pricing decisions by managers of regulated and unregulated firms.

4. Cash Accounting for OPEBs Distorts Competition in Labor and Telecommunications Service Markets

Regulated and unregulated firms compete for workers in the labor market, and with prices set by cash accounting for OPEBs, regulated firms face different incentives to offer wages, pensions, and OPEBs to workers than those of unregulated firms. With competition for telecommunications services, the consequences of this distortion are even greater. Price limits for regulated firms in competitive markets today are set through a price cap formula whose starting point was based on cash accounting costs for OPEBs. Competitors' prices are determined by their economic

costs which include OPEB costs as measured by accrual accounting.[11] As interstate access services become more competitive, it is essential that regulatory distortions in pricing be removed.

While any departure from economic costs sends the wrong signals to ratepayers, the adverse consequences are much greater when a utility faces growing competition. In the case of a monopoly utility, the inappropriate deferral of cost recovery produces prices that are too low early on, but too high later. These price signals will cause too much service to be consumed in the earlier period and too little later on. However, for the amount of service provided in each period, there is no reason to believe that the utility's incentives to produce efficiently are distorted.

When regulated markets are opened to competitive entry, the inefficiencies from inappropriate timing of cost recovery become more important. There are two reasons for this observation. First, since true economic costs play a crucial role in the terms and conditions for competition, any deviation from true economic cost in the measurement of the incumbent utility's cost can distort the competitive process. For example, if the price floors for competitive services are based upon inappropriate cost recovery assumptions, they could be too low in an early period and too high later on. Such an outcome could frustrate the objective of the most efficient firm being able to provide competitive services.[12]

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[11]This phrase should not be taken to imply that Pacific Bell's competitors will quickly move to fund OPEBs or to change their prices when they change their accounting. In unregulated markets, prices are set by the market and by the level of economic costs. Irrespective of accounting conventions, economic forces will drive the firm's prices towards a level consistent with accrual accounting for OPEBs

[12]The incremental cost for a given service includes as a labor component, the accrued OPEB expenses associated with the labor needed to provide that service, but it does not include any of the historical costs that arose from deferring recovery of costs associated with previously provided services.

Second, with competition and incentive regulation, the FCC can no longer guarantee recovery of deferred costs. In particular, the utility is at risk for the recovery of the historical liability under incentive regulation. Failure to adjust price ceilings to offer the utility the opportunity (1) to cover these historical costs and (2) to recover the economic costs of ongoing operations under competition raises the real possibility that the utility will never fully recover legitimately incurred costs of service.

5. Conclusion

To have a perceptible economic effect, an accounting change must cause a change in some prices in the economy. In competitive markets, prices are determined by the interaction of customer wants (demand) and costs of production (supply). A change in accounting convention clearly has no effect on customer demands. If accounting changes are to affect prices at all, they must affect the economic cost of producing goods and services and thus the amount that firms are willing to supply at a given price. Economic theory teaches that firms make supply decisions on the basis of economic costs, not accounting costs. When a profit-maximizing firm decides whether or not to hire an additional worker, it weighs the value of the additional output the worker produces against the additional cost that hiring the worker entails. If the compensation package for a worker includes OPEBs, a profit-maximizing firm would include the expected present value of OPEB costs as a cost in its hiring decision. A firm which ignored OPEB costs would hire too many workers and would experience higher than minimum costs in the long run. A competitive firm that made hiring decisions based on cash accounting figures for OPEBs would hire too many workers today (when its pool of accumulated retirees with OPEBs is small) and too

few workers later (when its annual cash OPEB obligation is large). Competition in the market--particularly entry from profit-seeking firms--drives prices towards economic costs which in turn forces high cost firms to leave the market. Thus, in competitive markets, the firm's supply curve--the amount of goods and services it is willing to produce for a given price--must reflect the economic cost of OPEBs regardless of their accounting treatment. A change to accrual accounting for OPEBs would have no effect on output prices in competitive markets: effectively, the accrual has already been recognized by the market and is reflected in the market price. A similar analysis shows that accounting changes would have no effect on non-competitive (but unregulated) markets.

In regulated markets, however, accounting changes can have significant effects on prices. The essence of the regulatory process is a connection between recognized or adopted accounting costs and prices paid by ratepayers. A rate-of-return regulated firm is entitled to an opportunity to recover its recognized accounting costs plus a fair return on its investment. In the interstate jurisdiction--and most other regulatory jurisdictions--cash accounting has been authorized by the Commission for OPEB expenses. In contrast with unregulated markets, there are no forces at work in regulated firms that require managers to recognize economic costs. Thus, the regulated prices which began the price cap regime for Pacific Bell were based on cash accounting for OPEBs.

However, Pacific Bell's liability for OPEB benefits was being created while employees worked, not when they retired--just as in unregulated markets. Cash accounting resulted in prices which were equal to a measure of cost of service which

understated the true current cost of using an employee to provide service. Only when that employee retired and began using benefits, would cash accounting begin to recognize those costs. Thus, the current cash accounting treatment for OPEBs leads to intertemporal inequities in regulated markets in which future ratepayers will pay a portion of the costs of providing current services.

Adopting FAS 106 and recognizing the difference in costs as an exogenous cost change would lead to the same price level that would have occurred if FAS 106 had been adopted before the beginning of price cap regulation. If FAS 106 had been adopted while the industry was subject to rate of return regulation, the initial levels of prices for price caps would have been set at a level to recover the amortization of the historical liability for OPEBs prior to 1993 and the ongoing expense for OPEB liability incurred in the current year. In addition, since earnings are measured with respect to accounting costs, if FAS 106 had been adopted before the beginning of price caps, measured earnings for sharing with ratepayers would reflect economic costs of OPEBs. Thus the prices (and measured costs) that would exist today if accrual accounting for OPEBs had predated price cap regulation can be attained by adopting an exogenous cost change for FAS 106.

In summary, competitive forces drive prices towards economic costs, but regulatory ratemaking sets prices using adopted accounting costs. In unregulated markets, prices already reflect accrual accounting costs for OPEBs because those are the actual economic costs. However, prices in regulated markets have been (and are currently) set to recover cash accounting costs for OPEBs, not accrual accounting costs. Prices of rate-of-return and price-cap regulated firms thus entail an intertemporal

misallocation of costs in which future ratepayers pay a portion of the economic costs of current services. To correct this inequity, the accounting costs of the regulated firm--and its prices--must be adjusted to recover each year's economic costs as they are incurred and to amortize as quickly as possible the accumulated liability for past years' OPEBs. For price-cap regulated firms, a Z-adjustment must be made to the price cap. Subsequent to adoption of accrual accounting by the FCC, if no price cap changes were allowed, (i) the intertemporal cost misallocation would continue, and (ii) the sharing mechanism would incorrectly transfer funds between shareholders and ratepayers. A Z-adjustment would also lead to the same level of prices that would prevail had accrual accounting for OPEBs been adopted prior to price cap regulation.

C. Exogenous Cost Changes in the Price Cap Formula

In its decision implementing price cap regulation, the FCC recognized the need to adjust the price cap to reflect exogenous cost changes.[13] The definition of an exogenous cost change was given in the decision:

> "Exogenous costs are in general those costs that are triggered by administrative, legislative or judicial action beyond the control of the carriers...These costs are created by such events as separations changes; USOA amendments; changes in transitional and long term support; the expiration of amortizations; and the reallocation of regulated and nonregulated costs."[14]

[13]Federal Communications Commission, Second Report and Order, CC Docket 87-313, released October 4, 1990, pgh. 166.

[14]Ibid.

The adoption of FAS 106 is a change in accounting procedures, and the FCC price caps decision recognizes such changes as exogenous events:

> "Changes in LEC costs that are caused by changes in Part 32 of our Rules, the Uniform System of Accounts (USOA), will be considered exogenous. We make this classification on the basis that such changes are imposed by this Commission and are outside the control of carriers."[15]

From the perspective of an economist, a Z-adjustment that changes prices for price-cap regulated firms to reflect accrual accounting costs for OPEBs promotes economic efficiency because it moves prices towards economic costs. However, changes in wages (for example) for a regulated firm represent changes in economic costs, and yet few economists would recommend that wage changes be accorded Z factor treatment.[16] In what sense then is the cost change from adoption of FAS 106 different from the cost change from a (hypothetical) wage increase?

Like wages, OPEBs are an element of the compensation package for workers, and Pacific Bell has roughly the same ability to raise or lower OPEB expenses as it does to raise or lower wages.[17] What is beyond the control of the firm are (i) the change in accounting standards, and (ii) the build-up of an historical liability that has resulted from cash accounting in the past. Changes in accounting standards clearly have nothing to do with Pacific Bell management, and the historical liability represents deferred compensation earned by its employees for services rendered in the past.

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[15]Ibid. pgh. 168 [footnotes omitted].

[16]If changes in wages could be passed through to ratepayers by means of a Z-adjustment, the regulated firm would have little incentive to control the wages it pays.

[17]This ability is, of course, not unlimited. Pacific hires workers in competitive labor markets, and changes in OPEB benefits affect its ability to attract and maintain its workforce.

To understand how these accounting changes should be treated under price caps, it is useful to separate the OPEB expense under accrual accounting in any year into two parts:

1. the amortization of the embedded OPEB liability as of 1993, and

2. the on-going accrual associated with current year employees.

Thus the difference between expenses under accrual and cash accounting can be visualized as having two parts: the amortization of the embedded liability plus the difference between accrual expenses for current operations and cash-based accounting OPEB expenses.

The proposed 15 year amortization of the embedded liability can be correctly treated as a pair of Z-adjustments,[18] just like any other amortization (e.g., inside wire and the depreciation reserve deficiency in the FCC price cap plan). The costs in question have already been incurred, and the liability has been quantified.

The second component of the difference in expense streams can be calculated as the difference between OPEB costs associated with current operations and cash-based accounting OPEB expenses. By managing its operations prudently after the one-time 1993 Z factor adjustment, the firm can attempt to control the accrual for OPEBs--just as total OPEB expenses under cash accounting have been treated as endogenous expenditures under the price cap plan. If changes over time in this

[18]One Z-adjustment would be made in 1993, and an offsetting Z-adjustment would be made fifteen years later when the amortization expires.

difference were passed through as annual Z-adjustments, the firm's incentive to manage its OPEB costs prudently would be diminished.

The proposed Z-adjustment in the price cap aligns rates and costs as if price caps had been implemented with prices set using accrual accounting for OPEBs. That one-time change adjusts for the fact (recognized exogenously in FAS 106) that the prices under which price caps were implemented did not reflect the true economic cost of OPEBs offered to workers up until that time. After implementation of the Z factor adjustment, OPEB expenses would again be under management control just like wage expenses. Thus adoption of FAS 106 aligns accounting costs and economic costs, and Pacific's proposed Z-adjustment would align its initial prices with economic costs.

With initial rates set at their appropriate level, Pacific Bell's management would then have the incentive to manage OPEB expenses in the same manner as all other costs.[19] All else equal, if OPEB costs increase, Pacific Bell's earnings would decrease, and vice-versa. These are the same risks and incentives faced by firms in unregulated markets which compensate workers with similar packages of wages, pensions, and OPEBs. Z factor treatment for FAS 106 cost changes would not diminish the incentives of the firm to control its OPEB expenses. Thus, from an economist's point of view, FAS 106 cost changes meet the test for exogeneity as used in the theoretical derivation of the price cap formula.

[19]In this sense, FAS 106 cost changes are similar to separations cost changes, which are the prototype example of an exogenous cost change. Both types of changes are changes in accounting costs, not economic costs. In both cases, the firm can control future expenditures. Nonetheless, separations changes are treated as exogenous cost changes because they enable the regulator to change prices in different jurisdictions.

In this sense, FAS 106 cost changes are similar to separations cost changes, which are the prototype example of an exogenous cost change. Both types of changes are changes in accounting costs, not economic costs. In both cases, the firm retains some control over future expenditures. Nonetheless, separations changes are treated as exogenous cost changes precisely because they enable the regulator to change prices in different jurisdictions:

> "...we will require an exogenous cost adjustment for changes in interstate costs for LECs that are caused by changes in the Separations Manual. As we explained in the Second Further Notice, these changes are imposed by regulators and are outside the control of the carriers...Regulatory decisions that are designed to produce just and reasonable rates must affect the cap in order to ensure that the system results in rates that are just and reasonable."[20]

In the case of OPEBs, the FAS 106 accounting decision must affect the cap in order to ensure that the price cap is based on economic costs.

D. Applying the Price Cap Formula

How should the Z-adjustment for the change to accrual accounting for OPEBs be calculated in the price cap formula? For the regulated firm, the difference in 1993 expenses under FAS 106 and under cash accounting for OPEBs should be estimated and expressed as a fraction of the total annual revenue requirement. For the U.S. economy, a similar calculation should be made for those markets in which accounting cost changes will lead to price changes which, in turn, will affect the growth

[20] Second Report and Order, CC Docket 87-313, released October 4, 1990, pgh. 167

of GNP-PI. The difference between these effects determines the 1993 Z-adjustment under price caps.

There are several ways in which this simple calculation may appear to overstate the price change required to pass through the cost changes stemming from the FAS 106 accounting changes. First, to the extent that FAS 106 changes affect all U.S. firms, there may be some change in the GNP-PI associated with FAS 106, and simply flowing through the firm's cost change would result in double-counting. The derivation of equation (4) presented above makes it clear that only the difference between the effect of FAS 106 on Pacific Bell costs and on U.S. average costs should be passed through as a Z-adjustment.[21] The rest of the cost change stemming from FAS 106 would be recovered from the assumed change in GNP-PI.[22]

A second apparent double-counting stems from the presence of prices of medical services as a component both of GNP-PI and of Z, the firm's expected change in costs stemming from FAS 106. If a Z-adjustment is made in 1993 (for example) so that the price cap reflects accrual accounting for OPEBs, that Z-adjustment will become part of the price cap that will be adjusted every year by GNP-PI - X. Since the OPEB Z-adjustment already includes expected medical inflation, one might think that the Z-adjustment should not be corrected in every future year for inflation. Possibly it should be isolated from the price cap index in the future, so that,

[21] That is, if an exogenous event led to a 1 percent reduction in GNP-PI and a 4 percent reduction in telephone company costs, the appropriate Z-adjustment would be a 3 percent reduction in price.

[22] We showed above that the change to accrual accounting was already reflected in prices for competitive markets. The impact of FAS 106 on output prices in the economy will be approximately zero. Thus the appropriate Z-adjustment for the regulated firm will be approximately its increase in accounting expenses.

effectively, it would not be multiplied each year by [1 + GNP-PI - X]. But that would be wrong.

The actual OPEB cost incurred in 1993 is a function of future medical prices. If the OPEB Z-adjustment were made correctly in 1993, it would raise the price cap to the level it would have attained if Pacific Bell had been under accrual accounting for OPEBs all along.[23] Because the Z-adjusted price cap in 1993 represents actual costs in 1993, it follows from equation (4) that all parts of the 1993 price cap must be multiplied by [1 + GNP-PI - X] in 1994, or prices will no longer track costs, assuming that the productivity objective of X is met.

A common error is to examine the price cap adjustment formula and conclude that the GNP-PI term compensates the regulated firm for inflation in the price of its inputs, including medical services to retirees. If that were the case, then compensating the firm for inflation of its 1993 OPEB Z-adjustment might appear to be double-counting. However, the role of GNP-PI in the price cap adjustment formula is not to measure and compensate the firm for input price increases. Rather, GNP-PI is a measure of national output price increases, and the price cap adjustment equation assures us that if the firm meets its productivity target, its output price will have to be multiplied by [1 + GNP-PI - X] every year to keep prices equal to costs.

In summary, while compensating the regulated firm for changes in cost due to adoption of accrual accounting for OPEBs might at first give the appearance of double-counting in several ways, it does not.

[23] Apart from amortizing the historical liability.

1. The switch to accrual accounting will affect the GNP-PI, but we showed that the formula compensates the firm for the difference between the effect of the accounting change on its prices and the GNP-PI.

2. The Z-adjustment is based on forecasts of future medical inflation, so adjusting the OPEB Z-adjustment component of the price cap for inflation in future years may seem to be double-counting. However, we showed that this argument misinterprets the role of GNP-PI in the price cap formula, and adjusting the entire price cap by (GNP-PI - X) in subsequent years is necessary so that prices track costs.

IV. THE EFFECT OF FAS 106 ON PACIFIC BELL'S INTERSTATE PRICES

In this section, we combine the theory from the previous section with cost estimates for OPEB expenses obtained from Pacific Bell. We are informed that, as a result of adoption of accrual accounting for OPEBs in 1993, Pacific Bell's interstate revenue requirement (as if it were rate-of-return regulated) would increase by $29 million in 1993. We show that the effect of FAS 106 on the prices of other firms in the economy is small so that the effect of the change to accrual accounting on the growth of GNP-PI is very small (less than 0.12 percent). Thus Pacific Bell's price cap must also increase by close to $29 million (more than $27 million, as discussed below) so that its prices will cover its costs, and the intertemporal inequity by which future ratepayers pay for current services will be eliminated.

A. The Effect of FAS 106 on Pacific Bell Costs is Approximately 1.92 Percent

A shift to accrual accounting for OPEBs would lead to an increase in 1993 expenses, primarily because of the amortization of the historical OPEB liability. When the amortization expires after 2008, there will be a symmetric reduction in expenses under accrual accounting relative to cash accounting. For a rate-of-return-regulated firm, this shift in expenses would generate a similar shift in prices, reducing the inter-generation inequity. To insure that the change to accrual accounting for OPEBs also eliminates the inter-generation inequity for price-cap-regulated firms, we must pay special attention to how the annual Z factor adjustments are made.

The Z-adjustment to prices to account for FAS 106 should equal the change in expenses attributable to FAS 106. In turn, the change in 1993 expenses attributable to FAS 106 would equal the change in revenue requirements resulting from the change from cash to accrual accounting for OPEBs.[24] Specifically, let A_t be the incremental revenue requirement for OPEBs in year t under accrual accounting and C_t be the incremental OPEB revenue requirement under cash accounting. Then the 1993 proportional expense change ΔE_{1993} would be

$$\Delta E_{1993} = \frac{(A_{1993} - C_{1993})}{(\textit{Total Revenue Requirement})_{1993}} . \tag{5}$$

[24]Pacific Bell's interstate expenses for OPEBs reflect partial implementation of accrual accounting in that Pacific Bell is currently using tax-deductible funding vehicles for OPEBs. Thus, the change in expenses represents the effects of full implementation of accrual accounting.

In accordance with the accounting requirements under FAS 106, Pacific Bell has estimated the expenses that would be incurred under cash and accrual accounting for OPEBs.[25] For the interstate jurisdiction, OPEB revenue requirements under accrual accounting would be $59 million in 1993 compared with cash accounting expenses of $30 million. Therefore, Pacific's revenue would have to increase by $29 million in 1993 in order for the company's revenue to match what its 1993 expenses would have been had the FCC adopted accrual accounting for OPEBs before price caps were begun. This increase represents a price increase of about 1.92 percent, based on an estimated Pacific Bell 1993 interstate revenue billing base of about $1,493 million.[26] Assuming the 1993 interstate revenue requirement is about $1,493 million, application of equation (5) would produce a price increase of about 1.92 percent (relative to prices under continued cash accounting for OPEBs) in the first year.[27]

B. The Effect of FAS 106 on the GNP-PI is Less Than 0.12 Percent

Under price caps, a utility's exogenous cost changes will be fully recovered through changes in the GNP-PI if (i) they are of the same relative size as for a typical firm in the U.S. economy, and (ii) the typical firm will pass through the

[25] As we understand it, Pacific's estimate of expenses under accrual accounting is based on an Accumulated Post-retirement Benefit Obligation that has been reduced by the amount of the tax free funding Pacific has already incurred. Without this funding before the start of FAS 106 requirements, the OPEB expenses under accrual accounting for 1993 would be greater.

[26] This estimate is conservative (high) because it includes anticipated revenues before sharing. Revenues that just matched the benchmark rate of return of 11.25 percent would be lower, thus increasing the percentage increase in exogenous expenses.

[27] [$59 - $30]/$1,493 = 1.92%.

exogenous cost change in higher prices. For the adoption of FAS 106, we have shown that, in theory, the historical liability for post-retirement benefits would logically already have been captured in the output prices of firms in unregulated markets. To a first approximation, since most of American GNP is produced by firms whose prices reflect economic costs, the accounting change required by FAS 106 will result in no contemporaneous change in the GNP-PI.

Historical experience also suggests that accounting changes have negligible effects on prices in unregulated markets and in the U.S. economy as a whole.[28] In 1987, the FASB changed the method of accrual accounting for pension benefits, a change which is similar in principle to the change contemplated in FAS 106, though smaller in magnitude. A search of the empirical literature reveals two studies of the effects of these accounting changes which both show no relationship between accounting changes and stock prices.[29] Assuming that (i) changes in stock prices reflect changes in anticipated profits and (ii) changes in accounting costs do not change economic

[28]Modern finance theory as well as practicing financial analysts recognize that accounting changes do not change the underlying economic reality. For example, in discussing the ramifications of FAS 106, Solomon Samson of Standard & Poor observed, "The realities do not change simply because someone puts down a different number. Part of our trade is adjusting published numbers to reflect economic realities." (BNA Pensions and Benefits Daily, September 27, 1991.)

[29]NERA undertook A DIALOG Database system search of the relevant literature, including the Economic Literature Index (1969-present), the Academic Index (1976-present), the Conference Papers Index (1973-present), Management Contents (1974-present), and Dissertation Abstracts (1961-present). These databases were searched using as keywords: "FASB," "Financial Accounting Standards Board," "Statement 87," "87," "pensions," and "economic". Fifteen publications were identified and two were relevant: (i) Sheree S. Ma, "An Empirical Examination of the Stock Market's Reaction to the Pension Accounting Deliberations of the Financial Accounting Standards Board," Doctoral Dissertation, University of Alabama, 1989, and (ii) Samuel S. Tung, "Stock Market Reactions to Mandatory Changes in Accounting for Pensions," Doctoral Dissertation, University of Wisconsin, 1987. Both works showed that no changes in stock prices could be attributed to the 1987 pension accounting changes.

costs, the fact that accounting changes do not affect stock prices implies that accounting changes do not affect output prices.[30]

To refine this approximation somewhat, we observe that prices of some goods and services will change when FAS 106 is implemented in 1993: notably (i) regulated public utility services and (ii) certain government purchases of services under contracts which historically covered only pay-as-you-go costs and prospectively allow FAS 106 accruals. In 1987, regulated public utilities produced approximately 6.13 percent of U.S. GNP. Total government contract purchases (not just cost-plus contract purchases) were 4.36 percent of GNP in 1987.[31] In total, what might be called the "cost-plus" sector of the economy produced less than 10.49 percent of GNP in 1987. We use 1987 for comparison because the 1987 government contract data is the latest available. Note that these proportions do not change much over time; Table 1 shows these proportions for 1980 and 1987.[32] If all firms experienced the same expense change from FAS 106 in 1993 as Pacific Bell and if prices in the unregulated economy already reflect OPEB costs measured on an economic basis, then the overall price level in the U.S. would increase by less than 0.20 percent in 1993 when accrual accounting is

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[30]This follows from the observations that (i) profits represent the difference between output prices and costs and (ii) accounting changes affect neither profits nor costs.

[31]A GSA report tracks the annual value of Federal Government contracts issued in each year: see General Services Administration, Federal Procurement Data System Standard Report. For 1987, the amount of Federal contracts issued was $197.3 billion which represents an update (obtained by telephone from the Federal Procurement Data Center) of the published figure.

[32]Regulated public utilities include railroad transportation, local and interurban passenger transportation, pipelines other than gas, telecommunications, and electric, gas, and sanitary services. See U.S. Bureau of the Census, Statistical Abstract of the United States: 1990, (110th edition), Washington, D.C., 1990, pp. 425-426. We include data for 1980 to show that the industry components of GNP are reasonably stable over time.

Table 1.
Relative Size of the Cost-Plus Sector

	GNP by Industry current $ billion 1988		GNP by Industry current $ billion 1987	
GNP	$2,732.0	(percent)	$4,526.7	(percent)
Railroad	$20.8		$19.6	
Passenger transit	$5.4		$8.1	
Non-gas pipelines	$4.7		$5.3	
Telecommunications	$60.2		$108.3	
Electric, gas, sewer	$68.4		$136.4	
TOTAL UTILITIES	$159.5	5.84%	$277.7	6.13%
GOVERNMENT CONTRACTS			$197.3	4.36%
TOTAL COST-PLUS SECTOR			$475.0	10.49%

implemented.[33] Under these assumptions, less than 10.49 percent of Pacific Bell's exogenous cost change would be accounted for in the GNP-PI, and the required Z factor would exceed 89.51 percent of the exogenous cost change.[34] This estimate is unrealistic because all U.S. firms have not used OPEBs to the extent that Pacific Bell has.

An additional refinement to this upper bound would recognize that the effect of FAS 106 on Pacific Bell is far greater than on the typical firm in the U.S.

[33]Pacific Bell expenses will increase 1.92 percent. If all cost-plus firms have the same proportional OPEB liability as Pacific Bell, the average liability will be a weighted average of 1.92 percent in the cost-plus sector and 0 elsewhere. Thus (1.92 * 0.1049) + (0.0 * 0.8951) = 0.20. Recall that this estimate is an upper bound because (i) all government contract purchases are included in the cost-plus sector, not just government purchases under cost-plus contracts, and (ii) the impact of FAS 106 on Pacific Bell is greater than on an average firm.

[34]10.49 percent equals 0.20/1.92; and 89.51 percent equals 1.72/1.92.

economy. In order to understand what the important differences are, we engaged William M. Mercer, a leading employee benefits consulting firm, to develop and analyze basic facts about post-retirement benefits other than pensions. The most important differences between Pacific Bell and a typical firm appear to be the following:

1. Coverage: Pacific Bell provides post-retirement benefits to its entire pension-qualified labor force. In contrast, only about 40 percent of private sector workers are employed by firms that offer post-retirement health benefits.[35]

2. Historical liability: Pacific Bell estimates that its accumulated historical postretirement benefit obligation will be about $0.5 billion in 1993 in the interstate jurisdiction. This amount is about 33 percent of Pacific's annual interstate revenues, about 21 percent of Pacific's interstate net rate base, and about 37 percent of the equity component of the net rate base. In contrast, the accumulated historical liability for the U.S. economy is estimated at about $300 billion.[36] This amount represents about five percent of U.S. GNP and on the order of 7 to 10 percent of corporate equity.[37]

U.S. OPEB expenses are estimated to be about $13 billion in 1993 on a cash accounting basis compared with about $82 billion on an accrual basis in 1993.[38] The

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[35]United States General Accounting Office, "Extent of Companies' Retiree Health Coverage," Prepared for Congress, March 1990 (GAO-1990).

[36]Statement of Gregory J. McDonald, United States General Accounting Office, Before the Subcommittee of Health, Ways and Means Committee of the House of Representatives, May 6, 1991.

[37]U.S. General Accounting Office, "Companies' Retiree Health Liabilities Large, Advance Funding Costly," Report to Congress, June 1989 (GAO-1989). Mark Warshawsky, "The Uncertain Promise of Retiree Health Benefits: An Evaluation of Corporate Obligations," Retiree Health Benefits Seminar, American Enterprise Institute, Washington, D.C., April 9, 1991.

[38]Mercer first evaluated a number of existing studies of corporate obligations for OPEBs and concluded that the GAO-1991 study was the most reliable in terms of credibility and methodology. This study produced an estimate of $42 billion for accrual accounting expenses under FAS 106 procedures in 1991. Mercer then modified a number of assumptions to conform more closely with FAS 106 requirements and carried the calculations forward to 1993, in the process producing the higher figure.

change is thus $69 billion out of an estimated GNP of $6,260 billion, or 1.10 percent.[39] Since the incidence of OPEBs appear to be uniformly distributed across industries, it is reasonable to assume that firms in the cost-plus sector increase prices by 1.10 percent in response to FAS 106.[40] Firms in the rest of the economy have already reflected accrual accounting in their prices, so the net effect of FAS 106 on the GNP-PI would be less than 0.12 percent (twelve-hundredths of one percent) instead of the 0.20 percent bound calculated above.[41] Thus, if cost-plus firms experience the U.S. average OPEB expense increase (1.10 percent) instead of the Pacific Bell increase (1.92 percent), GNP-PI would increase by less than 0.12 percent and the required Z factor would exceed 1.80 percent. Thus, less than 6.26 percent of the exogenous cost change is reflected in the GNP-PI, leaving more than 93.74 percent to be recovered through the Z factor.[42]

This estimate of the effect of FAS 106 on the GNP-PI is an upper bound for several reasons. First, we have overstated the size of the cost-plus sector of the economy by assuming that all public utility prices are set using accounting costs and treating all government contracts as cost-plus contracts with accounting change escalators. Second, this calculation ignores second-order effects that would lower the impact on national output prices. As prices rise in the cost-plus sector, for example,

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[39]The 1993 GNP forecast was downloaded from Data Resources, Inc.

[40]A GAO survey in 1990 compared health coverage of retirees by type of industry and concluded that there was "little variation among companies with retiree health benefits when comparing companies by industry group," GAO-1990 Report, pp. 6-7. Thus the impact of FAS 106 on expenses for firms in the cost-plus sector should be roughly the same as the U.S. average of 1.10 percent.

[41]Thus (1.10 * 0.1049) + (0.0 * 0.8951) = 0.12 percent.

[42]Because [1.92 - 0.12]/1.92 = 93.74 percent and 0.12/1.92 = 6.26 percent.

consumers substitute away from these goods and services which reduces the net effect of the price increase in the cost-plus sector on overall inflation. Finally, the calculation ignores second-order macroeconomic responses to the change in output prices through changes in government expenditure, interest rates and the money supply.

A summary of these calculations may be useful. Recall that we wish to increase Pacific Bell's price cap by 1.92 percent which represents the change in expenses due to the shift from cash to accrual accounting for OPEBs in 1993. Some of this increase will be accounted for by the change in inflation; the rest must be supplied through the Z-adjustment we are calculating. The increase in inflation due to FAS 106 is measured in two steps: (i) we calculate the effect of FAS 106 on the expenses of an average firm to be 1.10 percent, and (ii) we calculate the fraction of GNP produced by firms whose prices do not already reflect accrual accounting for OPEBs to be less than 10.49 percent. Since the incidence of OPEBs across industries is roughly constant, we estimate that the prices at which less than 10.49 percent of GNP is sold will increase by 1.10 percent, so that the increase in GNP-PI, averaged over all firms, will be less than 0.12 percent. Using this bound as an estimate, Pacific Bell's 1.92 percent price increase would thus consist of a 0.12 percent increase in GNP-PI and a 1.80 percent Z-adjustment. The required Z-adjustment (net of the change in GNP-PI) is thus at least 93.74 percent of the $29 million change in expenses, or at least $27 million.

These results are stable with respect to the various assumptions and forecasts that we have made. In Table 2, we summarize our previous results and provide new estimates assuming (i) a 100 percent increase in the effect of FAS 106 on an average

Table 2
Summary of Results
and
Sensitivity Analysis

	BASE CASE	NATIONAL FAS EFFECT IS 100% LARGER	COST-PLUS SECTOR IS 100% LARGER	PB REVENUE FORECAST IS 10% LARGER
PAC BELL FAS EFFECT	1.92%	1.92%	1.92%	1.74%
GNP-PI EFFECT	0.12%	0.23%	0.23%	0.12%
Z-ADJUSTMENT	1.80%	1.69%	1.69%	1.62%
% FAS IN GNP-PI	6.26%	12.01%	12.01%	6.89%
% FAS IN Z	93.74%	87.99%	87.99%	93.11%
Z	$26,808	$25,166	$25,166	$26,629

U.S. firm, (ii) a 100 percent increase in the cost-plus proportion of the U.S. economy, and (iii) a 10 percent increase in our forecast of Pacific Bell's 1993 revenues. Clearly, the results are insensitive to the assumptions.

APPENDIX

In this Appendix, we provide the details of the derivation of the price cap annual adjustment formula. The logic follows that of Dr. Schankerman, whose presentation of the price cap formula formed the basis of the California price cap plan.[43]

A. The Relationship Among TFP, Input Price, and Output Price Growth

Consider a multiproduct firm having N outputs (Q_i^o, i=1,...,N) and M inputs (Q_j^I, j=1,...,M). We wish to calculate X and Z so that in all periods, economic profits are identically zero, i.e., that the value of total inputs (including a normal return on capital) equals the value of total output. The identity can be written as

$$\sum_{i=1}^{N} p_i Q_i^o = \sum_{j=1}^{M} w_j Q_j^I ,$$

where p_i and w_j denote output and input prices respectively. Differentiating this identity with respect to time yields

$$\sum_{i=1}^{N} \dot{p}_i Q_i^o + \sum_{i=1}^{N} p_i \dot{Q}_i^o = \sum_{j=1}^{M} \dot{w}_j Q_j^I + \sum_{j=1}^{M} w_j \dot{Q}_j^I ,$$

[43] Testimony of Mark Schankerman on behalf of GTE California Incorporated, Docket I. 87-11-033, Technical Appendix, pp. 1-3.

where a dot indicates a derivative with respect to time. Dividing both sides of the equation by the value of output $R = \sum_i p_i Q_i^o$ or $C = \sum_j w_j Q_j^I$, we obtain

$$\sum \dot{p}_i \left(\frac{Q_i^o}{R} \right) + \sum \dot{Q}_i^o \left(\frac{p_i}{R} \right) = \sum \dot{w}_j \left(\frac{Q_j^I}{C} \right) + \sum \dot{Q}_j^I \left(\frac{w_j}{C} \right),$$

where R and C denote revenue and cost. If r_i denotes the revenue share of output i and c_j denotes the cost share of input j, then

$$\sum_i r_i \, dp_i = \sum_j c_j \, dw_j - [\sum_i r_i \, dQ_i^o - \sum_j c_j \, dQ_j^I],$$

where d denotes a percentage growth rate: $dp_i = \dot{p}_i / p_i$. The first term in the above equation is the revenue weighted average of the rates of growth of output prices, and the second is the cost-weighted average of the rates of growth of input prices. The term in brackets is the difference between the rates of growth of weighted averages of outputs and inputs and is thus the change in TFP. We can write the equation as

$$dp = dw - dTFP.$$

Thus the growth in input prices less the growth in output prices is equal to the change in TFP. This result requires only that excess profits are zero in every period. It does not require cost minimization, profit maximization, marginal cost pricing, or constant returns to scale.

B. The Price Cap Adjustment Equation

We begin with equation (3) from the text:

(6) $$dp = dp^N - [\, dTFP - dTFP^N + dw - dw^N \,] + [\, Z^* - Z^{*N} \,].$$

If we measure national output price inflation by the change in GNP-PI, we obtain

(7) $$dp = GNP\text{-}PI - X + Z'$$

where $X = [\, dTFP - dTFP^N \,] + [\, dw - dw^N \,]$ and $Z' = Z^* - Z^{*N}$. Since the percentage change in the regulated firm's output price between years t-1 and t is just $[P_t - P_{t-1}] / P_{t-1}$, we can write equation (7) as

$$\frac{P_t - P_{t-1}}{P_{t-1}} = GNP\text{-}PI - X + Z'$$

so

$$P_t - P_{t-1} = P_{t-1} \times [\, GNP\text{-}PI - X + Z' \,]$$

which simplifies to

(8) $$P_t = P_{t-1} \times [\, 1 + GNP\text{-}PI - X + Z' \,].$$

Since revenue equals price times quantity, the revenue change associated with the price change in equation (8) is obtained by multiplying both sides of the equation by the fixed amount of quantity demanded:

$$q_{t-1} \times P_t = q_{t-1} \times P_{t-1} \times [\, 1 + GNP\text{-}PI - X + Z' \,]$$

or

(9) $$R_t = R_{t-1} \times [\, 1 + GNP\text{-}PI - X \,] + Z$$

where Z represents the total dollar value of the exogenous cost change rather than the unit cost change.